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Contents

Disclaimer

The Cover Shot

Selected from the collection of "BLOOM" exhibition held on 8 March 2011 in support of the Hong Kong Breast Cancer Foundation.

The photograph of plum blossoms was taken in Wuxi in the spring season.

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Editorial

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Editor

Dr. Jane CK CHAN

Interventional Pulmonology (IP) may not sound as familiar to our readers as Interventional Cardiology, while the key concepts underlying both specialties are quite similar. In Interventional Cardiology and Pulmonology, the cardiologist and pulmonologist respectively perform invasive procedures for diagnostic and therapeutic purposes. The delineation of an interventional cardiologist from a cardiac surgeon is usually by the use of the surgical scalpel, and from a non-inventional cardiologist by the use of the cardiac catheter. However, the delineation of IP-ist from either a chest surgeon or from a non-interventional chest physician is more difficult as all three specialists use the same flexible bronchoscope regularly in their practice. IP is therefore defined by the use of special tools which are spin-offs of the bronchoscope. Via the bronchoscope, the IP-ist will perform endobronchial ultrasound, endobronchial valve placement, thermoplasty, etc. The pleuroscope can also be considered a spin-off of the bronchoscopic technique. Although currently the training for IP procedures may vary from centre to centre in Hong Kong, it is very likely that in the not-too-distant future, IP would become an integral part of training of a respiratory physician.

In this issue, I am proud to present Dr Matthew Wong, Dr Bing Lam and Dr Johnny Chan, who are the leaders/pioneers in IP in Hong Kong. Besides expert input from our local scene, we are fortunate to have engaged local-born U.S.-trained chest physician Dr Arthur Sung, Director of IP and Bronchoscopy at the Beth Israel Medical Center, to be our guest editor as well as author on an interventional procedure which is still not available in Hong Kong, namely bronchial thermoplasty. This issue is further graced by the expert input of two thoracic surgeons, Dr Kazuhiro Yasufuku of Toronto and locally Dr Andrew Chung . Their input highlights the importance of collaborative work between the chest surgeon and chest physician.

Although not considered an IP procedure, the pumpless artificial lung has been included in this issue because of the novel theoretical advantages of this technology relevant to the respiratory intensivist. It is an intervention targeting to rest the lungs and to sustain adequate removal of carbon dioxide from the acutely injured lungs.

We are thankful to Professor Richard Yu and Dr Patrick Lau for their contribution in sharing the art and humanism of photography. Like medicine, photography is not just for the eyes but also for the hearts and minds.

May 2012 bring you Joy, Happiness, Good Health and Prosperity!!

EBUS-TBNA in patients with lung cancer or mediastinal lymphadenopathy

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This article has been selected by the Editorial Board of the Hong Kong Medical Diary for participants in the CME programme of the Medical Council of Hong Kong (MCHK) to complete the following self-assessment questions in order to be awarded 1 CME credit under the programme upon returning the completed answer sheet to the Federation Secretariat on or before 31 January 2012.

Introduction

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a minimally-invasive technique for the diagnosis of intrathoraic mediastinal pathologies. The majority of cases involve the diagnosis and staging of lung cancer with a single bronchoscopy session. Often, the abnormalities are detected with computed tomography (CT) or positron emission tomography (PET). These non-invasive diagnostic imaging modalities, however, can have variable testing accuracies depending on the population at risk (prevalence), as well as competing diagnoses that may lead to false positive results. Tuberculosis in Hong Kong is especially problematic due to its large disease burden and clinical manifestations with high false positive results with both tests. Tissue confirmation is therefore imperative with high-risk patients. Conventional flexible bronchoscopy (FOB) is useful in the diagnosis of endobronchial lesions, but many lung cancers are extraluminal and are not accessible by airway inspections. Alternatively, CT-guided needle biopsy is useful in diagnosis of peripheral lung lesions. However, CT-guided needle biopsy has significant risks of pneumothorax (25%) and chest tube insertion rate (5%) as compared to the bronchoscopic approach and pathological lymph node staging of the mediastinum is lacking.[1,2] Mediastinoscopy should be reserved for patients with good performance status as a significant number of lung cancer patients have comorbid conditions that render them poor surgical candidates. EBUS-TBNA, on the other hand, is advantageous with its excellent diagnostic accuracies and tolerated by patients with limited function. This article will also discuss the roles of EBUS-TBNA in molecular testing for lung cancer patients, as well as the diagnoses for benign conditions such as sarcoidosis.

Lung Cancer: Diagnosis and Staging

The most common indication for EBUS-TBNA is for the diagnosis and staging of lung cancer via mediastinal nodal sampling. Common diagnoses are non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC). These tumours do not commonly have proximal endobronchial manifestations. Tournoy et al reviewed a group of patients with centrally-located suspicious intrapulmonary masses that are not visible during conventional bronchoscopy. In that study, 77% of 60 patients were confirmed to have lung cancer. The sensitivity was 82% with a negative predictive value of 23%. They observed that transthoracic needle biopsy or surgical diagnostic procedure was obviated in 47% and 30% of patients respectively.[3]

EBUS-TBNA has proven to be paramount for mediastinal staging of lung cancers. The extent of nodal metastasis remains the most important predictor and prognosticator for cancer survival. Additionally, nodal staging stratifies patients to multimodality therapies, such as neo-adjuvant therapy for locoregional mediastinal metastasis for resectable tumours. Taken together, pathologic (tissue) staging is obligatory for diagnostic and management strategies for lung cancers. Yasufuku reported the diagnostic and staging performance of EBUS-TBNA compared to CT and PET scans. EBUS-TBNA was found to be superior to CT and PET in sensitivity (92.3% vs 76.9% and 80.0%, respectively), specificity (100% vs 55% and 70%, respectively) and accuracy (98% vs 61% and 73%, respectively) in the prospective study of 102 patients with potentially operable lung cancer, (Table 1).[4] Another prospective study also demonstrated similar results in patients with enlarged mediastinal nodes on PET/CT. EBUS-TBNA had higher sensitivity (90% vs 70%, respectively), specificity (100% vs 60%, respectively) and accuracy (97% vs 62%,respectively).[5]

Table 1. Diagnostic performance of CT, PET, and EBUS-TBNA in the Correct Prediction of Mediastinal Lymph Node Staging[4]*

Tests	Sensitivity	Specificity	PPV	NPV	Accuracy
CT	76.9	55.3	37.0	87.5	60.8
PET	80.0	70.1	46.5	91.5	72.5
EBUS-TBNA	92.3	100	100	97.4	98.0

*Data are presented as %. When the results of the three modalities were analysed using X^2 tests describing the correct prediction of the lymph node status, the outcome was highly significant (p _ 0.00001).

Furthermore, the superior performance of EBUS-TBNA was not limited to patients with abnormal mediastinal nodes detected by imaging. It was also shown to be reliable in radiological "normal" mediastinum. In a group of 97 patients with normal PET activity, EBUS-TBNA was used to sample mediastinal lymph nodes

with a mean diameter of only 7.9mm (lymph node <1cm is regarded as normal on CT scan). Eight patients (8.2%) were positive for metastatic disease and only one patient was found to be false-negative, yielding sensitivity of 89%, specificity of 100% and NPV of 98.9%.[6]

Lung Cancer Molecular Profiling: EGFR, ALK and Kras

The American Cancer Society suggests that patients being considered for first-line therapy with EGFR TKI should have their tumour tested for EGFR mutation.[7] EBUS-TBNA is the preferred modality for sampling intrathoracic lymph nodes and establishing lung cancer diagnosis in locally advanced NSCLC.[8]

Sequential testing for EGFR, K-ras and ALK is a reasonable approach with specimens obtained by EBUS-TBNA.[8] Nakajima et al reported the utility of detecting EGFR mutation in biopsy samples obtained by EBUS-TBNA in 25.6% patients.[9] In another study by the same group, 156 patients with NSCLC underwent EBUS-TBNA, EGFR mutations were detected in 26.9 %, K-ras gene mutations were detected in 3.5% and p53 gene mutation in 41.6%.[10] Sakairi et al concluded that EBUS-TBNA is feasible for obtaining adequate tissue from intrathoracic lymph nodes that can be analysed for ALK fusion genes.[11] In detection of EGFR mutations and K-ras mutation, specimens obtained by EBUS-TBNA (4%) and body-fluid (3.7%) showed lower insufficient sample rates than cases obtained by CT-guided FNA (7.5%) or ultrasound-guided superficial FNA (10%) in 209 cytology specimens. [12]

Mediastinal Lymphadenopathy Other Than Lung Cancer

Extrathoracic malignancy

Pathological diagnosis is important in patients with underlying extrathoracic malignancy who present with suspicious mediastinal involvements. In a cohort of 161 patients suspected to have intrathoracic lymph node metastases from an extrathoracic malignancy, 68 % patients were confirmed to have malignant intrathoracic lymphadenopathy. EBUS-TBNA had sensitivity and negative predictive value of 87% and 73%, respectively. Twelve percent of patients were diagnosed as having new lung cancer and 9% were diagnosed with sarcoidosis.[13]

Lymphoma

In a large prospective study of 98 patients who presented with isolated mediastinal lymphadenopathy, EBUS-TBNA diagnosed 76% of the patients with lymphoma but 25% of them still underwent surgical biopsy due to inadequate sample. The sensitivity and specificity was 57% and 100% respectively. The diagnostic accuracy of EBUS-TBNA for lymphoma is therefore regarded as lower than lung cancer diagnosis/staging.[14] Ko et al reported that rapid on-site evaluation (ROSE) may improve definitive diagnosis and classification of malignancy.[15]

Sarcoidosis

The role of EBUS-TBNA inflammatory and infectious diseases has been studied. Wong et al reported the first series of 65 sarcoidosis patients with radiological stage I-II disease with clinical features of sarcoidosis. EBUS-TBNA was able to achieve 91.8% diagnostic yield.[16] When compared to diagnostic approach employing transbronchial lung biopsy (TBLB) and bronchoalveolar lavage (BAL) with CD4/CD8 ratio, EBUS-TBNA had a superior sensitivity of 90.3%, compared with 61.3% for BAL and 32.3% for TBLB.[17] A multicentre study of 137 patients with clinical features of sarcoidosis in 15 centres in Europe demonstrated the sensitivity was 71% with either EBUS-TBNA or EUS-FNA. Other diagnoses included TB, lymphangitis carcinomatosa, pneumoconiosis and alveolitis.[18]

Tuberculosis lymphadenopathy

There is a paucity of literature describing the role of EBUS-TBNA in infections (tuberculosis and fungal disease). Many of these findings were "incidental" outcomes with the original studies evaluating for either malignancies or sarcoidosis. The role of EBUS-TBNA in immuno-compromised patients has not been defined and has only been described in anectodal case reports.[19]

A multi-centre, observational study of 156 consecutive patients diagnosed with tuberculosis (TB) lymphadenitis was reviewed. EBUS-TBNA showed pathological TB findings in 134 patients (86%) and positive TB culture in 74 patients (47%).[20]

Comparison and Contrast with Other Diagnostic Modalities

Endoscopic ultrasound-guided fine needle aspiration (EUS-FNA)

EBUS-TBNA has both overlapping and complementary characteristics to EUS-FNA, which is performed via the transoesophageal route. EUS-FNA has access to mediastinal lymph nodes on the left mediastinum and below the carina, but has limited access to the right sided mediastinum and hilum (Figure 1). Furthermore, para-aortic lymph nodes and hilar nodes also cannot be reached by EUS-FNA.[21] Nonetheless, the combination of EBUS-TBNA and EUS-FNA were shown to have higher diagnostic performance than each individual procedure alone.[22-26] EUS- FNA has the advantage of reaching the extrathoracic area such as coeliac axis nodes and the left adrenal.[27]

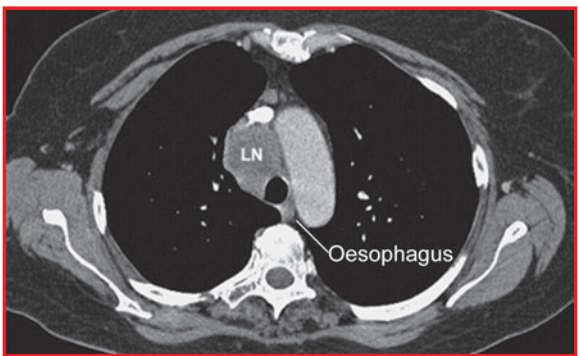

Figure 1. The trans-oesophageal route used in Endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) has limited access to right paratracheal lymph node (LN) which, however, is readily approachable by Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA).

Mediastinoscopy

Prior to the introduction of EUS and EBUS-TBNA, mediastinoscopy was the only reliable option for mediastinal sampling. EBUS can access nodal stations of both mediastinum and bilateral hilum, including the interlobar and more distal lymph nodes. In contrast, while mediastinoscopy can effectively sample paratracheal stations, it has limited access to more distal hilar structures. However, the negative predictive value of mediastinoscopy is superior to EBUS-TBNA (or EUS-FNA), due in part to larger biopsy specimens. Therefore, a non-diagnostic cytologic result from EBUS-TBNA should be followed with mediastinoscopy to rule out malignancy.[28-30]

A recent prospective controlled trial in a group of 190 patients with normal mediastinal lymph nodes (6.9+/-2.9mm) showed no significant difference in diagnostic yield between EBUS-TBNA and mediastinoscopy. No complications were seen with EBUS-TBNA and minor complications were seen in 2.6% of patients with mediastinoscopy.[31] Therefore, EBUS-TBNA can give both histological diagnosis and the highest pathological staging when the most distal lymph node station is sampled. Therefore, EBUS/EUS FNA sampling should be considered as a first-line procedure as they are well tolerated by patients with favourable risk-benefit profiles.

Limitations

While EBUS-TBNA has access to many mediastinal and hilar nodal stations, the para-aortic nodal stations 5 and 6 are beyond reach. If there are no other accessible lesions, then surgical options, such as anterior mediastinotomy, extended cervical mediastinoscopy, or video assisted thoracoscopy can be considered for sampling of these nodes.

Many literatures cite the EBUS-TBNA specificity to be close to 100 %. The high specificity is in part due to the selection bias of EBUS-TBNA patients with larger size nodes as compared to the surgical mediastinoscopy groups. Furthermore, most studies do not confirm a cytologically positive EBUS-TBNA result with a gold-reference standard (such as VATS). On the other hand, the sensitivity of EBUS-TBNA is not high enough to rule out malignancies, (Table 2). The negative predictive value (NPV) was 81% for EBUS-TBNA in one large study involving 494 patients.[32] Nondiagnostic findings were found in as high as 10 % of the cases.[33-35] A local study in 122 consecutive patients who underwent EBUS-TBNA showed that, among those with negative results, up to 19% patients had false negative lymph nodes.[36]

Table 2. Relative diagnostic utility of mediastinal staging investigations based on data from systematic reviews[50]

Technique	Sensitivity (%)	Negative predictive value (%)	Prevalence (%) (range)
Cervical mediastinoscopy	78–81	91	39 (15–71)
Conventional TBNA	76–78	71–72	75 (30–100)
EBUS-TBNA	90	76	68 (17–98)
EUS-FNA	84–88	77–81	61 (33–85)

Abbreviation: EBUS-TBNA, endobronchial ultrasound-guided transbronchial needle aspiration; EUS-FNA, endoscopic ultrasound-guided fine needle aspiration.

Several determinants were identified to have possibly affected the diagnostic yield for EBUS and a higher diagnostic yield was observed if the size of the lymph node was bigger; positive positron emission tomography scan; the patient smoking history, and the organisation level annual hospital TBNA volume.

Contraindications

Contraindications are similar to conventional flexible bronchoscopy. Patients should be more than 6 weeks from any cardiac ischaemic events, and have no bleeding tendency e.g. platelet dysfunction, taking clopidogrel or anticoagulants. In addition, because of the limited angulation of the EBUS scope, the transnasal route should be avoided and the patient should be able to lie flat or in a semi-recumbent position.

Complications

EBUS-TBNA is generally regarded as a safe procedure. The largest survey on the complications related to EBUS-TBNA was recently published as an abstract. EBUS-TBNA procedures were performed in 1323 patients and trainees were involved in 82% of the bronchoscopies. Transbronchial lung biopsy (TBLB) was also performed in 12% patients in addition to the EBUS-TBNA. Procedure related complications occurred in 19 patients (1.5%) that included bleeding (n=3), pneumothorax (n=7) and 4 required chest tube drainage, sustained hypoxia (n=4), unexplained hypotension (n=1), respiratory failure (n=3) and significant airway injury leading to death (n=1). This is the first report of associated mortality.[37]

Infections

Mediastinitis, pericarditis and bacteriaemia

Mediastinitis with or without bacteriaemia developed in three patients ranging from 2-13 days after the procedures and all resolved after given oral antibiotics.[38,39]

More complicated infections requiring intervention were also reported that included infective pericarditis with tamponade effect necessitating emergency pericardial drainage 19 days after EBUS-TBNA for lung cancer. Within the same institution, another patient had EBUS-TBNA for metastatic disease. The patient developed septic features with a new mediastinal mass having multiple air pockets. Both cases were using extended full length TBNA needles.[40] Another patient developed more serious mediastinitis with an extensive mediastinal abscess 10 days after EBUS-TBNA, which required thoracotomy and drainage of 50ml purulent material. Postoperatively, the patient remained critically ill with septic shock and required mechanical ventilation. Prolonged intravenous antibiotics were given in Intensive Care.[41] Another serious complication was reported which required aggressive surgical debridement and antimicrobial therapy in a patient who developed empyema, lung abscess and mediastinal abscess following EBUS-TBNA of mediastinal lymphadenopathy which was subsequently confirmed as metastatic HCC.[42]

Prophylactic antibiotics for EBUS-TBNA were not shown to be indicated. However, empiric antibiotic with activity against indigenous oral organisms should be the drug of choice if infection develops after the procedure.

Respiratory arrest with sedation

Respiratory arrest during EBUS-TBNA leading to abortion of procedure without further intervention was noted in one patient amongst 92 with extrathoracic malignancies. Full recovery was observed. The patient had COPD and was sedated with midazolam and fentanyl. [43]

Pneumothorax and laceration of main bronchus

Pneumothorax developed in the right upper zone in a patient after EBUS-TBNA to the right lower paratracheal lymph node (#4R) and confirmed NSCLC. Tube drainage was required.

Laceration of the left main bronchus was noted after one needle pass during the needle aspiration of the subcarinal lymph node, the most common targeting area.[44]

Training

In terms of EBUS-TBNA, according to the European Respiratory Society/American Throacic Society joint statement on interventional pulmonology, initial training of 40 supervised procedures with 25 procedures per year to maintain competency is recommended.[45] Although it was primarily based on experience with radial probe EBUS, the acquisition and interpretation of ultrasound images is similar and theoretically EBUS-TBNA is more technically demanding as the operators should be familiarised with the interventional needle puncturing in addition to the acquired EBUS interpretation. Both radial probe EBUS and EBUS-TBNA have significantly slow implementation with the learning curve. [46-49]

Conclusions

EBUS-TBNA represents a new technology in the field of interventional pulmonology and thoracic Surgery. The primary indications for EBUS-TBNA are diagnosis and staging of lung cancer. The role has also been extended to other mediastinal lymphadenopathy such as tuberculosis, Sarcoidosis, metastatic diseases from extrathoracic malignancy and fungal infection. It provides a minimally-invasive approach and should be considered as the first option for diagnosis and staging. Surgical confirmation should be pursued when negative result of a suspicious lesion is obtained from EBUS-TBNA, especially when the pre-test probability of lung cancer is high.

Since the introduction of EBUS-TBNA to Hong Kong in 2005, it has become widely available across the territory over the years. Although it has high diagnostic performance, both physicians and the public should be aware of the potential complications which can be serious. Training in EBUS-TBNA should be formalised and learnt in the context of a dedicated team's approach.

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MCHK CME Programme Self-assessment Questions

Please read the article entitled "EBUS-TBNA in patients with lung cancer or mediastinal lymphadenopathy" by Dr. Matthew KY WONG and Dr. Kazuhiro YASUFUKU and complete the following self-assessment questions. Participants in the MCHK CME Programme will be awarded CME credit under the Programme for returning completed answer sheets via fax (2865 0345) or by mail to the Federation Secretariat on or before 31 January 2012. Answers to questions will be provided in the next issue of The Hong Kong Medical Diary.

Questions 1-10: Please answer T (true) or F (false)

1. EBUS-TBNA is performed under local anaesthesia in a bronchoscopy session.
2. Regarding to the mediastinal staging for lung cancer, the sensitivity obtained by PET scan and EBUS-TBNA is ~90% and 80% respectively.
3. Regarding to the diagnostic and staging performance, EBUS-TBNA has a specificity of 100% for lung cancer involvement in the mediastinum.
4. The specimens obtained by EBUS-TBNA are usually adequate for cytological examination but not adequate for molecular profiling e.g. EGFR.
5. Because of the high negative predictive value obtained by EBUS-TBNA, mediastinoscopy is now obviated for mediastinal staging for patients with lung cancer.
6. EBUS-TBNA is useful in the diagnosis of malignancy but not benign conditions.
7. EUS-FNA cannot approach access the right paratracheal and bilateral hilar lymph nodes whereas EBUS-TBNA can.
8. A non-diagnostic result from EBUS-TBNA should be followed by mediastinoscopy because mediastinoscopy can access nodal stations more than those by EBUS-TBNA.
9. EBUS-TBNA is generally safe and no mortality has been reported.
10. EBUS-TBNA can be performed by pulmonologists or thoracic surgeons who have acquired the skills in conventional bronchoscopies.

ANSWER SHEET FOR JANUARY 2012

Please return the completed answer sheet to the Federation Secretariat on or before 31 January 2012 for documentation. 1 CME point will be awarded for answering the MCHK CME programme (for non-specialists) self-assessment questions.

EBUS-TBNA in patients with lung cancer or mediastinal lymphadenopathy

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Answers to December 2011 Issue

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Pleuroscopy: a promising tool for pulmonologists

Dr. Johnny Wai-man CHAN

MBBS (HK), MSc (Lond)(Respir Med), FRCP (Edin, Glasg & Lond)
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Introduction

Pleuroscopy is also known as "Medical Thoracoscopy" or "Local Anaesthetic Thoracoscopy",[1] and refers to a thoracoscopic examination of the pleural space in a spontaneously breathing patient under local anaesthesia. The procedure has equipped the respiratory physicians and thoracic surgeons with a useful and relatively non-invasive tool to investigate various pleural diseases, in addition to the conventional means such as pleural aspiration and closed pleural biopsy.

Case presentations

Patient 1

A 75 year-old ex-smoker presented with progressive shortness of breath and malaise. Chest radiograph revealed right-sided massive pleural effusion. Computed tomography (Fig.1) revealed, apart from the massive effusion, the presence of pleural nodules and a collapsed lung. Since repeated pleural aspirations and closed pleural biopsy failed to yield a definite diagnosis, he was offered pleuroscopy under local anaesthesia. Whitish pleural nodules and plaques were noted over the parietal pleura (Fig. 2), biopsies of which confirmed the presence of bronchogenic squamous cell carcinoma. Talc pleurodesis was subsequently performed after drainage of the malignant pleural effusion.

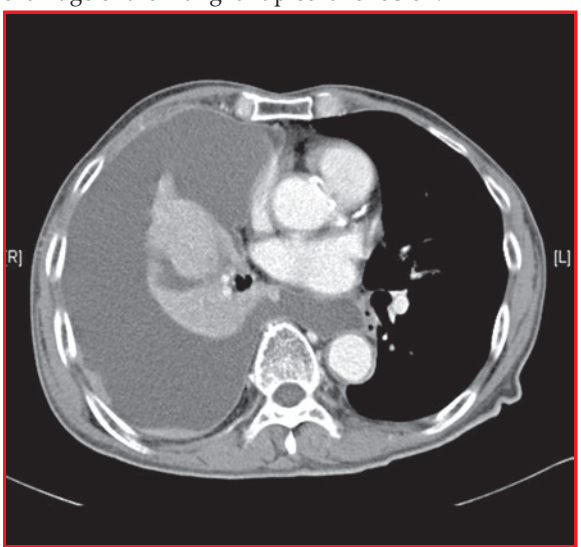

Fig. 1 CT thorax of Patient 1

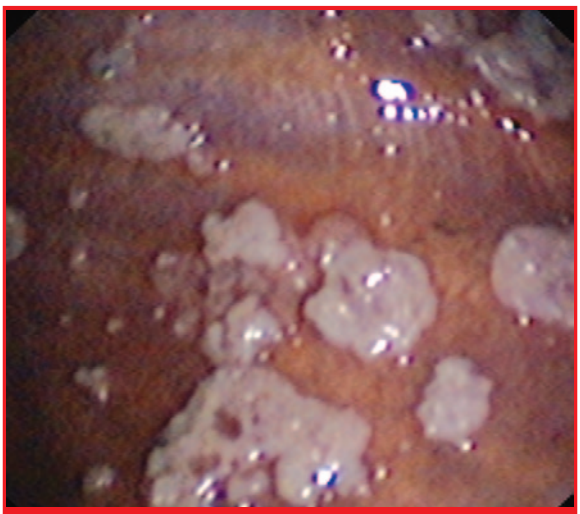

Fig. 2 Pleuroscopic appearance of Patient 1

Patient 2

A 40 year-old Indonesian domestic helper presented with weight loss and progressive reduction in exercise tolerance for a few months. Apart from the finding of a left-sided pleural effusion from the chest radiographs, all laboratory tests were normal. Pleuroscopy was performed after negative findings from pleural aspiration and biopsy. Fine "sago-like" nodules were visualised over the parietal pleura (Fig.3) and granulomatous inflammation characteristic of tuberculosis was obtained from subsequent histological examinations. No subsequent recurrence of pleural effusion occurred after initiation of anti-tuberculous treatment.

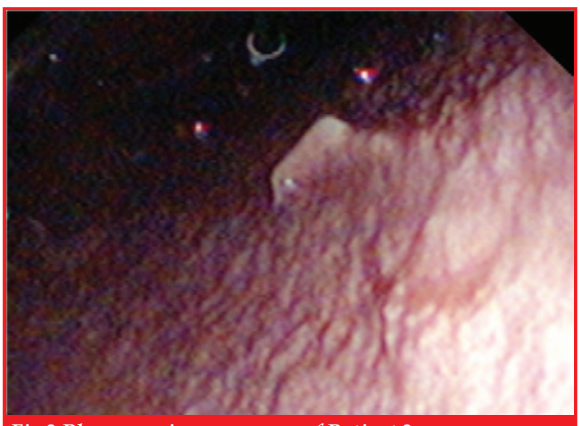

Fig.3 Pleuroscopic appearance of Patient 2

Pleuroscopy: Equipment, preparations and general techniques

In contrast to the conventional rigid instruments for medical thoracoscopy (telescope, trocar and biopsy forceps) that sometimes necessitate two portals of entry, the semi-rigid thoracoscope is similar in design and operation to that of a bronchoscope and requires a single portal of entry via a disposable plastic trocar. (Fig.4a and 4b) The endoscope consists of a handle and shaft with an outer diameter of 7 mm. The distal 5 cm of the shaft can be flexed, allowing a two-way angulation of 160°up and 130° down. Its 2.8mm working channel can allow the passage of a variety of endoscopic instruments such as biopsy forceps, needles and electrocautery probes.[2] Although respiratory physicians would find the operation familiar and easier to handle, the size of biopsies obtained from the forceps via the small working channel are relatively small, and which would limit the diagnostic yield particularly in the case of mesothelioma.[2-4] Also, some of its characteristics (semi-rigid nature, a short plastic trocar, operation via a single working channel and portal of entry) would not be ideal for difficult cases such as those with dense adhesions and thick chest wall.[1,4]

Fig. 4a Semi-rigid pleuroscope

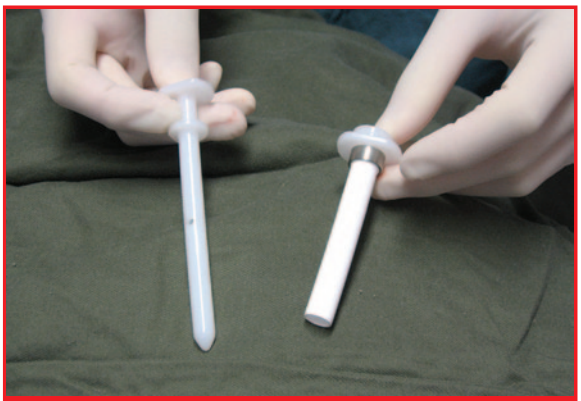

Fig.4b Disposable plastic trocar and cannula

The usual investigations before pleuroscopy[5] include blood tests (complete blood picture, liver and renal function tests and coagulation profile), electrocardiograph and chest radiographs. Computed tomography is helpful to delineate the thoracic anatomy in patients with undiagnosed pleural effusions, while thoracic ultrasonography is particularly useful to determine the amount of pleural effusion, location of the portal of entry and assessment of the degree of pleural adhesions and loculations. The procedure can be performed in the bronchoscopic suite, with the patient lying in lateral decubitus position with the unaffected hemithorax down. Conscious sedation with intravenous midazolam and fentanyl in careful titrations is the usual practice, although the safe use of propofol has also been described.[6] The conscious status, pain perception, oxygen saturation (SpO_2), cardiac rhythm, blood pressure and pulse rate are closely monitored during the process. After infiltration of local anaesthesia to the various layers of chest wall and pleura, the trocar is inserted in the mid-axillary line perpendicular to the chest wall, usually between the 4th and 7th intercostal spaces and which depends on the underlying indications and prior localisation by ultrasound.[7] After removal of pleural fluid, inspection of the pleural space and sampling of the parietal pleura with biopsies (preferably over a rib wherever possible), a chest drain is inserted at the end of the procedure. If talc pleurodesis is necessary, this can be done by insufflation via the trocar or via a catheter inserted through the working channel under direct visualisation.[8]

Clinical applications

Pleural effusion of unknown origin remains the commonest indication of pleuroscopy and is considered to be one of the techniques with the highest diagnostic yield in "aspiration cytology negative exudative effusions" from the recent British Guidelines , with an efficacy almost comparable to video-assisted thoracoscopic surgery (VATS).[1] The overall diagnostic sensitivity and specificity for malignant pleural effusions were both reported to be around 90%, with an overall diagnostic yield of 80-96% in rigid instruments.[2,3,5] The corresponding reported figures of semi-rigid instruments were similar[9] and our own institution's preliminary experience revealed a diagnostic yield of 79%.[4] The emergence of pleuroscopy, with its diagnostic yield of over 90% in pleural malignancies and approaching 100% in pleural tuberculosis, has led to debates and controversies regarding the continual clinical utility of closed pleural biopsies.[10] However, despite its higher diagnostic yield, pleuroscopy is considered by the international guidelines to a "reasonable next diagnostic step" if blind pleural biopsy is non-diagnostic in areas where tuberculosis is prevalent.[1]

Pleurodesis by talc insufflation is another common, and therapeutic, indication in pleuroscopy, with a pooled 1-month success rate of around 85% with both benign and malignant pleural effusions.[1] As surgical pleurodesis is considered to be more effective in both primary and secondary spontaneous pneumothoraces, medical chemical pleurodesis by chest thoracostomy is only recommended for those patients who refused surgery or not fit for surgery.[11] However, marginal surgical candidates may also be considered for talc pleurodesis via pleuroscopy, especially if undertaken by experienced practitioners, and with a reported long-term success rate of 95% in one series.[12]

Other more advanced applications of pleuroscopy would include treatment of pleural infection and empyema, visceral pleural and lung biopsies as well as sympathectomy. [13]

Safety issues

The procedure is generally considered to be safe and well-tolerated, especially with semi-rigid instruments with no reported mortality to date.[2,9] Mortality rates with rigid instruments were reported to be between 0.09 and 0.24%, and with reported complication rates from 2 to 6%.[2,3,5,7,16] Fever and subcutaneous emphysema, which were observed in our local series, were amongst the commonest reported complications.[4] The others would include persistent air leakage, re-expansion pulmonary oedema, cardiac arrhythmias, empyema, myocardial ischaemia and chest wall seeding by malignancies. The more sinister reported complications included air embolism, haemorrhage, pulmonary embolism and acute respiratory distress.[2,3,5,7,16] The use of graded talc of larger particle size[14,15] in pleurodesis has been associated with much fewer complications, particularly with the much dreaded adult respiratory distress syndrome.[17]

As complications can be potentially avoided by careful selection of patients, a number of contraindications have been laid down in a recent guideline.[1] The "absolute" ones would include the lack of informed consent, lung adherent to chest well throughout the hemithorax, hypercapnia or severe respiratory distress and uncontrollable cough. Severe obesity, recent myocardial infection (< 4 weeks), clotting dysfunction, renal failure, obstructive central airway tumour, untreated infections and active airway diseases are some of the "relative" contraindications.

Pleuroscopy: a promising tool

Although most of the published work on pleuroscopy have been case series and retrospective in nature, the reported efficacy and safety of the procedure seems to be very satisfactory. Also, there have not been any direct comparisons between VATS and pleuroscopy, as well as between pleuroscopies performed via rigid instruments against those performed via semi-rigid ones. However, with the relative ease of operation, satisfactory diagnostic yield and therapeutic efficacy, good tolerability and safety as well as the relatively low costs, pleuroscopy has proven itself to be a valuable tool in the management of pleural diseases such as undiagnosed or malignant pleural effusions. On the other hand, despite its less invasive nature compared to VATS, the procedure is still an invasive procedure that carries potential risks. As a result, adequate training, careful case selection as well as close collaborations amongst various parties such as respiratory physicians, thoracic surgeons, radiologists and pathologists are important to ensure optimal outcomes to patients.

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Pumpless artificial lung for acute lung failure: An overview

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Introduction

A major advance in respiratory critical care over the past 15 years has been a better understanding of the deleterious effects of mechanical ventilation (MV) on the lungs, this understanding having been translated into improved ways of MV and improved survival in patients requiring MV for acute lung injury and acute respiratory distress syndrome[1,2]. Terms such as volutrauma, atelectotrauma, and barotrauma have been used to describe the various detelerious effects of positive pressure MV.

In patients suffering from acute lung failure, lung-protective strategies in minimising ventilator-associated lung injury may still be straddled by challenging management issues such as hypercapnoeic acidosis[3] and ventilatory difficulties resulting from stiff lung mechanics and poor ventilation/perfusion matching.

The recent resurgence of interest in using extra corporeal membrane oxygenation (ECMO) in supporting patients with severe hypoxaemic respiratory failure in Hong Kong is partly related to a significant pool of relatively young patients suffering from the fulminant H5N1 pneumonia for which ECMO appears to play an important temporising role in sustaining gas exchange while minimising the untoward side effects of high intensity MV[4]. Such resurgence in interest is also partly attributable to newer more user-friendly ECMO devices. This user-friendliness is even more appreciable in the use of pumpless artificial lung, as the latter does not require an extracorporeal cardiac pump.

The design of this pumpless artificial lung (also known as interventional lung assist (iLA) Membrane Ventilator, or iLA in short) is easy to understand, and involves the following components (Figure 1):

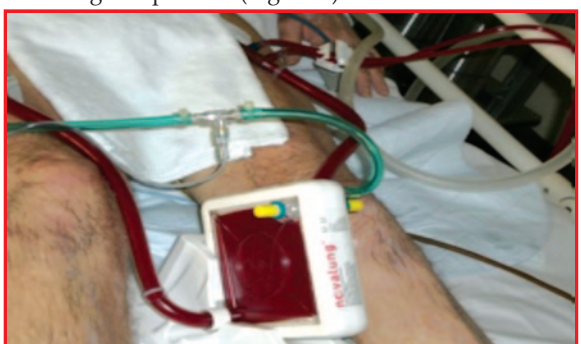

Figure 1. The usual position of the iLA Membrane Ventilator placed between the patient's legs

- Percutaneously inserted femoral cannulation for arterial blood to be directed away from the body
- Percutaneously inserted femoral cannulation for venous blood to re-enter the body
- An artificial lung which stands between the arterial cannula and venous cannula, providing a diffusion membrane for removal of CO_2. Removal of CO_2 is blood arterio-venous blood flow-dependent, which in turn is dependent on the systemic blood pressure, and the extent of extracorporeal blood clotting within the artificial lung.

The Hong Kong experience

Over 5000 applications have been undertaken since its introduction in Germany in 2000, with major users being Western Europe, the U.K. and Canada. The device is not FDA-approved yet in the U.S. In Hong Kong, we have only accumulated the experience for 2 patients. In the first patient, iLA was adopted as a last resort for a ventilated patient one week post-thoracotomy and aspiration pneumonia who demonstrated severe respiratory acidosis and cardiovascular instability. Upon initiation of iLA, the end-tidal CO_2 level immediately came down (Figure 2), and the respiratory acidosis was corrected. Nevertheless, the patient succumbed to circulatory failure from ongoing sepsis within a few days. iLA only effected transient clinical improvement.

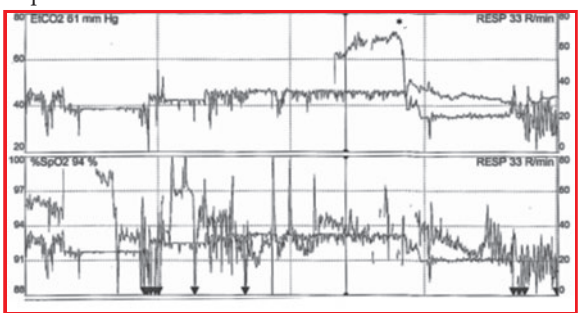

*Figure 2. The initiation of pumpless artificial lung (timing marked by *) immediately brought about a drop in the end-tidal CO_2 in this ventilated patient.*

In the second patient, a 45 year-old male patient, the clinical scenario was far more complex. The patient had a background history of fibrosing alveolitis on systemic steroids and presented with acute lung failure secondary to fulminant diffuse pneumonia caused by respiratory syncytial virus and cytomegalovirus (CMV pp65 antigenaemia at over 100 cells). HIV screening

was negative. Treatment with immunoglobulin and appropriate anti-viral drugs was given. His chest CT at the time of acute lung failure showed ground glass opacification and multiple large cysts (Figure 3). In view of the rapid development of cystic changes, further injury from positive pressure MV was feared, and hence iLA was applied for "saving" the remaining potentially treatable lungs. The patient's gas exchange showed predictable improvement on iLA, as shown by a predictable drop in the $PaCO_2$ level and in the minute ventilatory requirements, and a scaling down of MV. Nevertheless, after more than 3 weeks on the pumpless artificial lung, the patient's lung condition failed to improve, and the decision was made by the family for withdrawal of all life support.

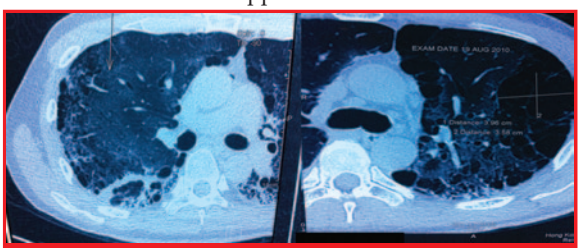

Figure 3. CT thorax of our second patient on iLA showing ground glass opacification in the right lung and large cystic changes in the left lung

In this second patient, the major difficulties in the use of the iLA were related to blood thinning and clotting. Initially, low molecular weight heparin was given to the patient in order to avert blood clot formation in the Membrane Ventilator. However, when the patient started oozing at the site of the femoral arterial cannulation, heparin was backed down, and dots started to build up in the Membrane Ventilator, which in turn led to a slower blood flow and less effective CO_2 removal. Eventually the extracorporeal device had to be replaced. Arterial oozing was at times brisk requiring repositioning and re-suturing of the arterial cannulation.

Evidence base for pumpless artificial lung

The evidence base in support of the use of iLA is currently from observational case series and case reports. The latter has involved patients who have failed conventional mechanical ventilation with hypercapnoeic acidosis and cardiovascular instability, and other patients suffering from severe pneumonia or multiple trauma with shock lung. Observations are similar in our patients in that improvements in CO_2 and pH levels were usually observed, along with more ease in ventilating these patients "gently" [5, 6, 7, 8]. Interested readers are referred to two recent reviews for a more detailed analysis of why iLA may "save the lung"[9, 10].

Summary

We have come a long way in identifying ways of supporting gas exchange in patients suffering from acute lung failure. Conventional MV, with particular attention given to volutrauma and atelectotrauma, remains a key life-sustaining modality for these patients. However, ECMO and pumpless artificial lung may find a promising role in those patients in whom ventilator-associated lung injury has created or will soon create a threat to the patient's lung survival and recovery. In the next few years, once the evidence base becomes broadened, the role of iLA will be further defined and its place in respiratory intensive care will take on more momentum; we may also witness more pro-active use of this device in the acute CO_2 retainer suffering from acute lung failure even before the patient is subjected to the physical trauma of MV.

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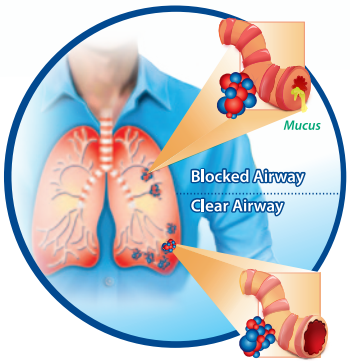

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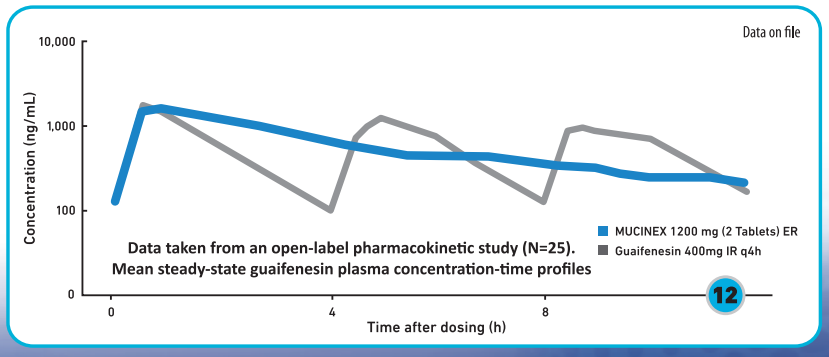

1 dose of Mucinex provides sustained delivery of guaifenesin for 12 hours

Prescribing Information:
Active Ingredient (in each extended-release tablet): Guaifenesin 600 mg; Expectorant. **Inactive Ingredients:** Carbomer 934 P, NF;FD&C blue #1 aluminum lake; hypromellose, USP; magnesium stearate, NF; microcrystalline cellulose, NF; sodium starch glycolate, NF. **Direction:** Do not crush, chew, or break tablet. Swallow tablet with a full glass of water. Adults and children 12 years of age and over: 1 or 2 tablets every 12 hours. Do not exceed 4 tablets in 24 hours. Children under 12 years of age: Do not use. If allergic to any of the ingredients: Do not use. **Uses:** Helps loosen phlegm and thin bronchial secretions. Symptomatic relief of deep chesty coughs. Expectorant for productive cough. **Warnings:** Ask a doctor before uses if you have; Persistent or chronic cough occurring with smoking, asthma, chronic bronchitis, or emphysema. Cough accompanied by too much phlegm (mucus). Stop use and ask a doctor if: Coughs last more than 7 days, comes back, or occurs with fever, rash, or persistent headache. This could be signs of serious illness. If pregnant or breast feeding: Ask a heath professional before use. In case of overdose, get medical help or contact a Poison Control Centre right away. Possible side effects: Nausea, abdominal discomfort and vomiting. Tell your doctor if you experience any side effects after taking this medicine, including any not listed here. Manufactured by: Reckitt Benckiser Inc. (USA). Additional information available upon request. **Other information:** Tamper evident: Do not use if carton is open or if printed seal on blister is broken or missing. Do not store above 30°C.

References: 1. Mucinex Product Labelling
* Pharmacy Times Survey: Expectorant Category

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Bronchoscopic lung volume reduction: A new treatment for emphysema

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Chronic obstructive pulmonary disease (COPD) is one of the leading causes of mortality and morbidity globally[1]. Smoking cessation, inhaled bronchodilators with or without corticosteroid, pulmonary rehabilitation and long term oxygen therapy are the current standard medical treatments. However, the benefits of medical treatments are limited in COPD patients with predominant emphysema. Exertional dyspnoea is the cardinal feature of emphysema and is attributed to severe impairment of respiratory mechanics, air-trapping leading to hyperinflation and flattening of the diaphragms.

Lung volume reduction surgery was shown to be beneficial in selected groups of emphysematous patients, namely upper-lobe predominant heterogeneous emphysema. However, due to the increase in short-term and perioperative mortality in patients with non-upper lobe heterogeneous COPD or the most severely affected patients, surgery has not been adopted widely[2]. Recent clinical trials have focused on less invasive alternatives to achieve lung volume reduction, i.e. bronchoscopic lung volume reduction (BLVR)[3]. The aim of the treatments is to collapse the non-ventilating lobe(s) or segment(s) to improve lung mechanics, as well as to reduce dynamic hyperinflation during exercise. Different technologies have been studied; these include one way endobronchial valves, biological sealants, and exhale airway stents.

1. One way endobronchial valve (EBV) (Figure 1)

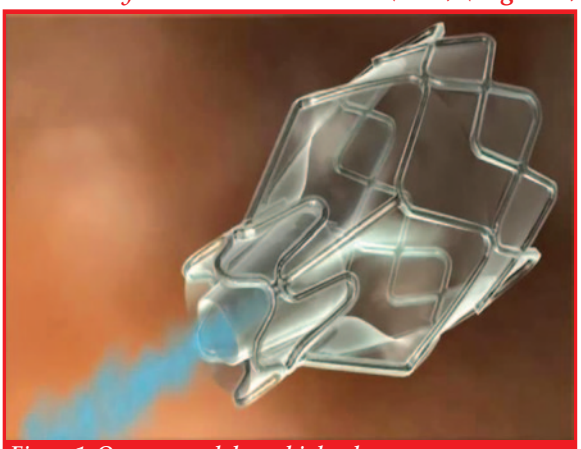

Figure 1: One way endobronchial valve

EBV works by allowing gas and mucus to escape from the target lobe (segment) during expiration and preventing air entry during inspiration. The valve(s) can be deployed to the target bronchi via bronchoscopy under local anaesthesia and conscious sedation. The efficacy of EBV has been evaluated in a multicentre randomised controlled trial[4]. Of 321 patients, 220 were randomised to EBV and the remaining patients to the control arm in a 2:1 ratio. At 6 months, there were modest improvement in lung function and 6 minute walk distance. The forced expiratory volume at first second (FEV1) of the EBV group increased by 4.3% but decreased by 2.5% in the control group. It should be noted that, however, neither the FEV1 nor the 6 minute walk distance at 6 months achieved the pre-specified 15% improvement as compared to the control group. At 12 months, the 6-minute walk test (a co-primary endpoint) did not demonstrate meaningful difference between the treatment group and the control group. During short term follow-up (90 days), there were more COPD exacerbations and haemoptysis episodes in the EBV group than the control group. Additionally, at one year, there were also more COPD related symptoms as well as hospitalisations seen in the valve group as compared to the control group. Factors associated with better outcomes of EBV treatment were heterogeneous emphysema, successful lobar occlusion by operators and complete fissures. The presence of incomplete fissures leads to collateral flow causing dynamic hyperinflation during exercise from the adjacent ventilated lung, thus obviating the advantages of volume reduction in the affected lobe.

The trial also showed that the FEV1 improved by 10.7% in patients with severe heterogeneous emphysema, while FEV1 improved by approximately 18% at 1 year in patients with complete fissures. The study illustrated EBV works better in the subgroup of emphysematous patients with heterogeneous emphysema and in patients with complete fissures. Currently, evaluation of heterogeneous emphysema can be enhanced by xenon ventilation CT of the thorax. Furthermore, regional collateral flow can be evaluated by the Chartis® system.

Xenon ventilation CT (Figure 2) is a novel lung imaging technology and uses dual-source and dual-energy technique. Xenon is a radio-opaque gas that is used as an inhaled contrast agent for CT to demonstrate impaired regional ventilation and identify the distribution of gases[5]. During xenon ventilation CT examination, the patient inhales 30% xenon gas (a mixture of 30% xenon and 70% oxygen) by a xenon ventilation system (Zetron V, Anzai Medical, Tokyo, Japan) for 90 seconds. The whole thorax is then scanned in full inspiration using the Somatom Definition Flash CT scanner (Siemens

Medical Solution). The segmental xenon ventilation can then be quantified by using the xenon concentration in the trachea as the reference (unpublished data).

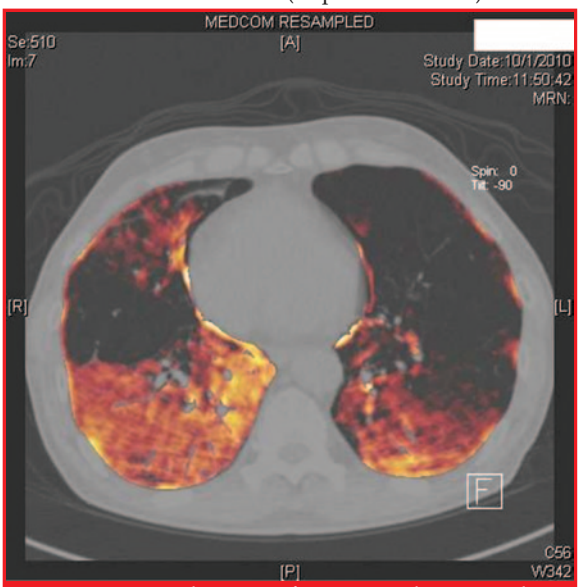

Figure 2 Transaxial section of xenon ventilation CT shows significant decrease in ventilation in right middle lobe and anterolateral basal segment of left lower lobe. (golden is good ventilation and black is poor ventilation)

The Chartis® system (Figure 3) (Pulmonox, Calif., USA) is a catheter-based system developed to obtain measurements predicting atelectasis after EBV treatment. By using this system, a pilot study showed that 90% of the treatment outcome correlated with the finding of the system[6].

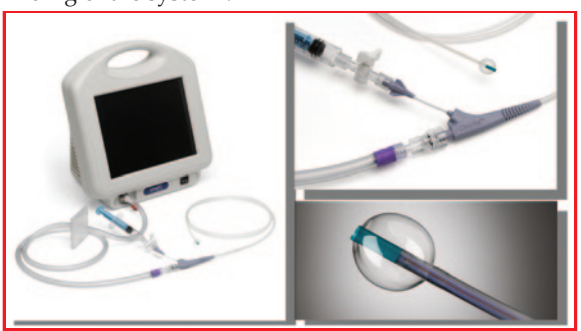

Figure 3. Chartis system

2. Biological agents

Biological agents work via the deployment of a biodegradable gel into the sub segmental bronchi via the bronchoscope to induce inflammatory responses at the target sites, resulting in scar formations and subsequent volume reduction. This technology intends to overcome the problems of collateral flow with intended obliteration of fissures by the sealant. A Phase II study has shown promising results with improvement of FEV1 of 15% six months after treatment[7]. No phase 3 study results are available yet.

3. Exhale airway stents

Exhale airway stents, or airway bypass technology, was developed and intended to create non-anatomical airways (or fenestrations) between the emphysematous lung and adjacent bronchi. The bronchoscopically created proximal passages release distally trapped air and result in lung volume reduction. However, the efficacy of the exhale airway stents has been evaluated in a multicentre double blind, randomised sham controlled trial[8] and did not achieve the co-primary endpoint. Of 315 homogeneous emphysema patients enrolled, 208 were randomised to the treatment arm while the rest were assigned to the sham controlled arm in a 2:1 ratio. At 6 months, there was no significant difference in the composite primary end point (FEV1 and dyspnoea score) between the two arms. The role of the exhale airway stents in patients with heterogeneous emphysema has not been defined.

Currently, the only available BLVR treatment option in Hong Kong is the one way endobronchial valve. It is our institutional practice to perform xenon ventilation CT of the thorax to assess and identify the sites of heterogeneous emphysema,. Once the sites are verified by imaging, the targeted lung segments are tested for collateral ventilation by the Chartis System®. Endobronchial valves are deployed if no collateral flow are detected at the target sites.

Conclusion

BLVR is a safe procedure compared to surgical lung volume reduction. It is an attractive treatment option for symptomatic patients with severe emphysema who have run out of medical treatment options. The success of the treatment depends on identification of optimal candidates for individualised endoscopic treatment modality. Xenon ventilation CT thorax is a useful tool to identify patients suitable for BLVR, and the Chartis® system helps to optimise the results for EBV treatment. With the ongoing efforts and the advancements in technologies, hopefully patients with severe COPD can be treated with more effective BLVR options in the future.

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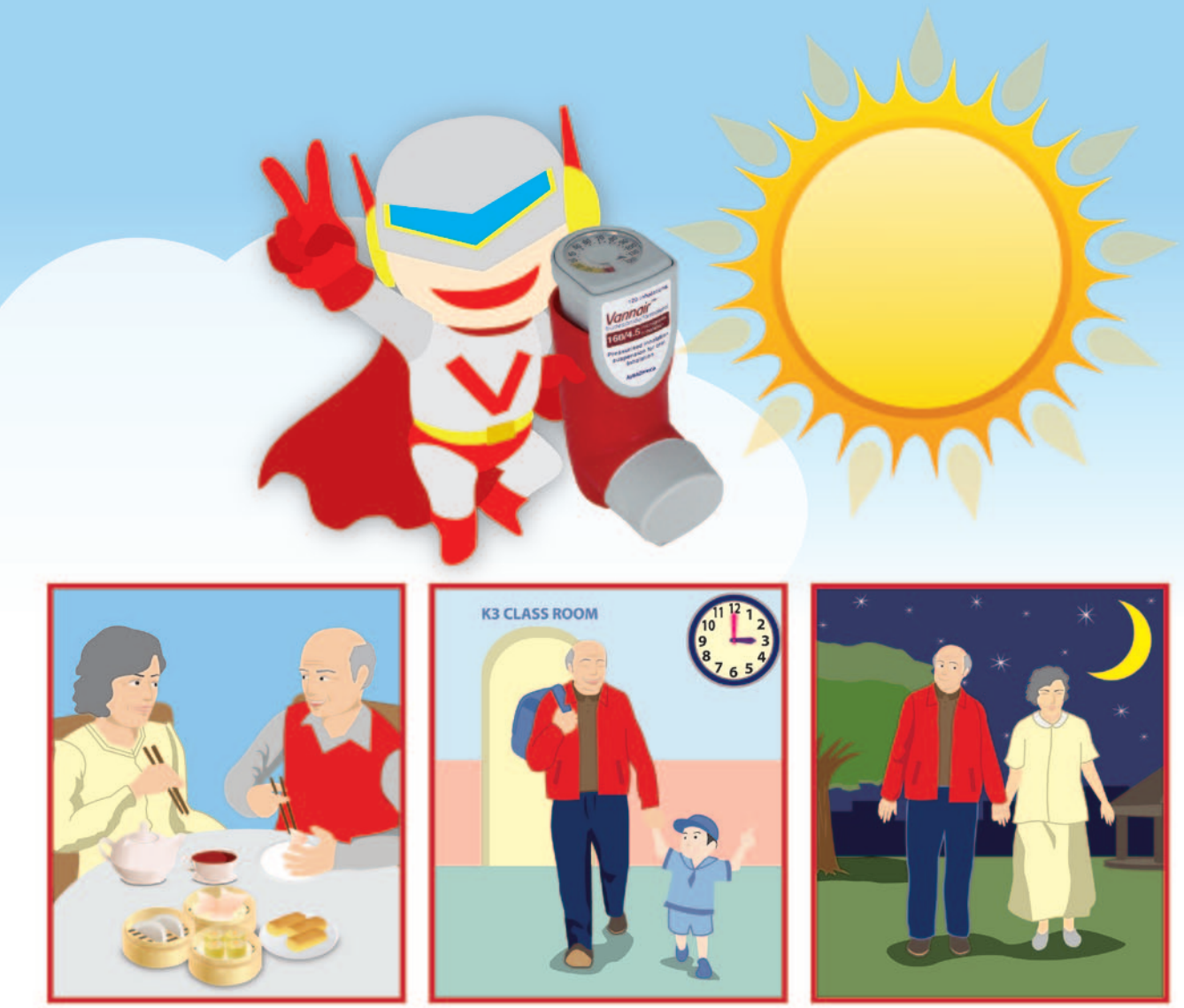

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Tracheobronchial Stenting: Review of its Indications and Uses with illustrative local cases

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Introduction

Stents have been extensively used across many medical disciplines, from cardiovascular, gastrointestinal, biliary, urological disorders, to thoracic diseases. The application of stents in thoracic diseases[1-6] has however been met with a number of constraints brought about by the unique anatomic structure of the airways.

Anatomic constraints of tracheobronchial stents

1. The early subdivision of the airways and the progressively tapering lumen render any standard design of airway stents more challenging.
2. In major airways, namely the trachea and main bronchi, the natural cough reflex can cause dislodgement and migration of the stent as well as ongoing minute rubbing movements.
3. Impingement of the vocal cords by stents placed in the subglottic or high trachea position can irritate the cords leading to laryngeal oedema and dysfunction and risk of silent aspiration.
4. Abrupt massive migration of tracheal stents can lead to acute laryngeal blockade[2].
5. Ongoing minute movements of stents and their constant exposure to mucosa-related antigens and microbial flora cause persistent mucosal irritation and sputum production, thus triggering the formation of granulation tissue. Large granulation tissue formed at two ends of the stents cause lumen reduction and local inflammation. The dilatory benefits of stenting may hence be truncated. The inhibition of mucocilliary clearance by an overlying stent may add to intraluminal blockade by retained sputum and dried crust[7].

Despite these factors, tracheobronchial stents provide good and immediate palliation in thoracic conditions especially in malignancy[8,9]. The major airway lends itself as a candidate for stenting because of its greater lumen and the ease for bronchoscopic access. Re-expansion of substantially large parts of the lung, by re-establishing patency or eliminating dynamic blockade, provides obvious benefits. Urgent stenting may serve as the only life-saving intervention in large airway stenosis in which intubation plays no role.

Indications for stenting

1. Definitive correction of major airway obstruction arising from either physical stenosis or dynamic expiratory collapse (most commonly)
2. Temporary support as following subglottiic stenosis repair or prophylaxis against swollen airway in chemo-radiotherapy for extrinsic tumour compression by intrathoracic tumours (occasionally)
3. Palliative sealing of tracheo-oesophageal fistula or tracheo-mediastinal fistula (rarely)

Clinical conditions leading to major airway obstruction are listed in Table 1. The most common conditions are carcinoma of lung, oesophagus and thyroid causing extrinsic compression or direct invasion. In earlier decades, tracheobronchial stenosis as a late sequel of tuberculosis, often seen in young females, used to be another common condition[10,11].

Contra-indications:

1. Non-functioning lung parenchyma and/or non-patent airways distal to an obstructing lesion
2. Mandatory mechanical ventilation in respiratory failure related to neuromuscular conditions

Technical considerations for airway stenting

Airway stenosis is a relatively rare respiratory condition. The patient might have been variably managed as for late onset asthma or some other mimicking conditions prior to definitive diagnosis. By the time airway stenosis is diagnosed, prompt attention and management is usually called for.

Placement of airway stents is a highly specialised skill. Owing to the rarity of the conditions, the operator usually needs to have acquired and mastered the necessary technical skills on the whole spectrum of different types of tracheobronchial stenosis in a major referral centre for a long period of time, usually for years after years.

Not only is the mastery of technical skills crucial to success, other prerequisites to safe, successful placement of airway stents include the availability of proper instruments and of experienced personnel, including surgical, anaesthetic and nursing expertise. The requirement for safe and accreditable standard necessitates the operator to be fully trained and versatile in different airway treatment modalities. A team of skillful personnel should perform the procedure in a highly controlled environment, i.e. in the operating

room fully equipped with basic and backup resources, including stents of various sizes, airway accessories, bronchoscopes, forceps, fluoroscopy and monitor equipment. Intensive care unit back up is preferable.

Table 1: Indications for stenting

I Airway obstruction

A Malignant

Extrinsic: Carcinoma of oesophagus, Carcinoma of thyroid, mediastinal tumour, Head and neck tumour(before resection)
Lymphoma, Para-aortic or mediastinal lymph node

Intrinsic: Carcinoma of bronchus, tracheal tumour, metastatic bronchial tumour, malignant trachea papillomatosis

B Non-malignant:

Acquired

a)Endoluminal narrowing:
Tuberculosis-related stenosis(endoluminal TB or post-inflammatory)
Post "Chronic infection" Stenosis including traction bronchiectasis
Wegener granulomatosis
Other autoimmune disorder/Sarcoidosis/Idiopathic inflammatory
Post-intubation stenosis /Tracheostomy stomal stenosis
Post-corrosive inhalation/thermal injury (cicatrical stenosis)
Leiomyoma of bronchus (pre-resection)
Anastomostic strictures:

Post transplant bronchial anastomosis stricture
Post brochoplastic procedure (sleeve resection)
Post radiation (brachytherapy)

b)Extrinsic compression:

Retrosternal Goitre (before resection)
Angiofollicular hyperplasia (lymphoid-disease)
Vascular compression (Aneursym, Arteriovenos fistula)
Mediastinal giant lipoma or dermoid cyst
Oesophageal submucosal tumour/Stent
Post surgical vascular/unknown compression
or Post Pneumonectomy Syndrome (PPS)

c)Tracheomalacia (dynamic obstruction)

Idiopathic tracheomalacia
Secondary tracheomalcia:

-Related to compression(usually prolonged)

Compression by vascular structure
1.anomaly, Vascular ring, Pulmonary artery sling
2.post-surgical (PPS)
Compression by goitre/fibrosing mediastinitis/ haematoma

-Injury on (i) intubation especially if prolonged and/ or elderly

(ii) Post-Tracheostomy stoma with floppy airway

-Relapsing polychondritis

Congenital

(a) Intraluminal: web, papillomatosis, agenesis/atrophy
(b) Extrinsic:

Compression by vessels :
1.Vascular ring (VR)
2.VR with anomalous origin of Right subclavian artery
3.Pulmonary artery sling
4.Brachiocephalic artery abnormal origin

Compression by congenital mediastinal cyst*:

II Fistula: Tracheo-oesophageal fistula / Tracheo-mediastinal fistula

III Peri-operative larynx splintage

(Support for laryngeal procedure - T tube with stent across the vocal cords)

- Subglottic stenosis repair
- Laryngeal benign tumour excision

*Examples are thymic cyst, thyroid or branchial cyst, duplication cyst, lymphocoele

Choice of airway stents

The quality of commercially available covered or uncovered stents has steadily improved in the past few decades. Recent introduction of biodegradable stents[12] (absorbable over 10-12 months) provides a new dimension in stenting of benign airway conditions.

Airway stents are in general classified into stents made of silicone or metal; a comparison between these two makes of stents is shown in Table 2. Between the non-expandable silicone stents and the self-expandable metal stents are the self-expandable silicone stents. A glossary of the various stents is listed in Table 3, with examples shown in Figure 1.

Figure 1 : Examples of stents

Fig. 1a Dumon stents (transparent and radio-opaque)

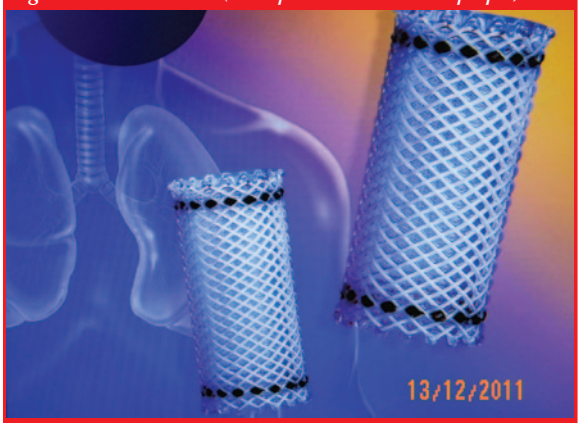

Fig. 1b Polyflex stents

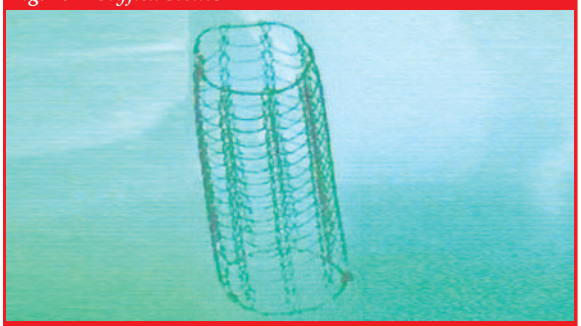

Fig. 1c Ultraflex stents

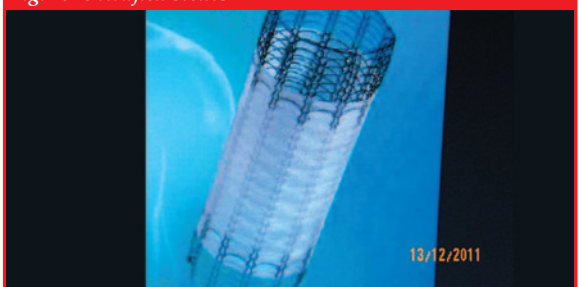

Fig. 1d Ultraflex covered stents

Table 2 : A comparison of silicone versus metal stents

Silicone stents	Metal stents
Characteristics	
Larger **wall** to lumen ratio	Larger **lumen** to wall ratio
Less expensive	More expensive
Radio-opaque and transparent	Radio-opaque
User-friendliness	
• Require rigid bronchoscopy & general anaesthesia	• Rigid bronchoscopy & general anaesthesia can be avoided.
• Retrievable; re-usable in the same patient	• Not retrievable after weeks
• Easily redeployable and its position adjusted	Position once deployed is difficult to adjust.
• Can be tailored made	
Migration/Mobility	
• Stud design helps to stabilise straight and Y stents.	• No choice of Y stent
• Can migrate especially towards proximal airway	• Less easy to migrate
• Mobility of stent can trigger granuloma formation.	• Not mobile
Sputum issues	
• Inert to tissue : Tend not to induce sputum production	• Cause tissue reaction and induce sputum production
• Smooth inner surface discourages pooling of secretions.	• Irregular inner surface encourages sputum pooling.
• Mucociliary clearance is blocked throughout length of stent.	• Mucociliary clearance can be restored after stent is epithelioid and integrated into mucosal wall
• Sputum pooling occurs at edges of stent.	• Sputum pooling within stent and at edges of stent can be a difficult problem (Fig. 5)
Other complications	
• No erosion into deeper tissue	• Expandable force of stent may lead to erosion through tracheal wall.
• Neighbouring mucosal surfaces are usually left intact.	• Metal edges irritate neighbouring mucosal surfaces.
• Stent fracture highly unlikely	• Strut fracture rather common; can cause haemoptysis

Table 3 : Stents Classifications and Types

	Types	Subtypes/ Examples	Description
Silicone stents	**Dumon stents** (most commonly used stents in HK)	Straight cylindrical stents with studs (Fig. 1a)	Studs help to anchor the stent in position.
		Y-stents with cylindrical main arm with non-studded straight side	Tailored-made angulated single lumen stent or Y-stent at larger angle is possible.
	Hood stents	Straight silicone stents with collars at both ends	Deployed by "pull out -scope" method.
		Y-stents	Long Y-stent difficult to deploy due to absence of specially designed loader.
	Trachea T tube (silicone tube with long side limb) (Novatech, Boston Medical, Hood)	T-shape tracheal stents Usually at right angle or 80o angle up	External side limb serves as safety air inlet and suctioning channel, usually covered by accessories.
		Generic T-tube stent (previously known as Montgomery T-tube)	Used as temporary splintage in subglottic stenosis repair (upper part protruding above vocal cords).
	T-Y tube	A combination of T-tube with distal part in the form of Y stent	
	Dynamic **Friberg stents**	A special type of Y-stent composed of 1.Tracheal limb adjustable length silicone stent with stainless steel reinforcement, and 2.Simple silicone side limbs on bifurcation (adjustable length, fixed angle). Important to note that it is placed by tailored-made deployment forceps (PilingR).	
Self-expandable silicone stents	**Polyflex stent**	Made of silicone and polyester mesh (Fig. 1b); lumen to size ratio is better because of thinner wall.	
	Nova stents (Novadis)	Silicone bands on two ends help prevent migration	
Metal stents	**Uncovered** metal stents	Wallstent (Boston Scientific)	Applicable to distal airways
		Other less commonly used metal stents include: Gianturco Z-stent and Palmaz stent (balloon expandable PalmazR stent)	
		Ultraflex stents (Fig. 1c)	Deployable thro' working channel of bronchoscope when compressed as small as 5 mm; MRI compatible; Release/Retrieve mechanism by pulling on dedicated suture,either emerging from loader's distal or proximal end on a guide wire.
	Covered metal stents (Boston Sientific)	Ultraflex Covered stents (Fig. 1d)	Retrievable by grasping a purse string suture at the ends through bronchoscope with entire stent collapsed & telescoped into a sheath for removal.
		Covered Wall stents	With bare or covered ends. If covered entirely, it avoids galvanic current or local nickel allergy. Granulation tissue formation hopefully reduced

Key considerations in choosing the appropriate stent include:

1. Route of placement/deployment of stent

Metal stents offer the advantage of being deployable by flexible bronchoscopy with fluoroscopy, while deployment of silicone stents is solely by rigid bronchoscopy under general anaesthesia. Modified silicone stents referred to as self-expandable silicone stents can be placed by rigid (preferred) or flexible bronchoscopy with transcervical percutaneous tracheal puncture under fluoroscopic guidance[5]. Stents in the distal airways can only be deployed by flexible bronchoscopy and hence they are exclusively metal stents.

2.Retrievability of the stents

Silicone stents are fully covered stents and not self-expandable. They do not become embedded in the mucosal layer and hence they are retrievable, redeployable stents. Modified silicone stents, referred to as "self-expandable silicone stents" are mostly retrievable. Being retrievable, these stents are at risk of proximal migration and formation of granulation tissue secondary to minute movements (Fig. 2).

Metal stents are made of Nitinol or alternative self-expanding alloy (elgiloy)[3]. They can be bare, or modified to include complete coverage of the metal wires with polyurethane or partial coverage with metallic ends. Covered metal stents, though not currently available in Hong Kong, are retrievable[13] by nature of their specific design.

In Hong Kong, available airway stents include silicone stents, self-expandable silicone stents, and uncovered metal stents (UMS). UMSs offer the unique feature of being immobile, in contrast to the silicone or modified silicone stents, as the UMSs tend to be incorporated into the mucosal wall in benign airway diseases and in conditions involving extrinsic malignant compression of the non-malignant mucosa. Rarely erosions outside the tracheal wall have been reported[14]. UMSs are hence not retrievable after a few weeks (around 6 weeks) into placement/deployment. Once deployed, the position can hardly be adjusted; pre-release fluoroscopy during deployment is essential. Attempt for re-deployment is not an option. Using another new stent increases the cost significantly.

3. Anatomy of the stenotic airways

Silicone stents offer the choice of a Y stent, which is not possible with metal stents. Silicone stents can also be tailored-made[15] to meet the specific anatomic needs of the stenotic airways; however, this is easier said than done, and may not be practical in our locality. Metal stents conform better to the airway's curvilinear shape especially in a tortuous tracheobronchial tree. Metal stents, given their expandability, can be deployed even in distal airways.

4. Considerations for potential complications

Complications arising from having an airway stent in situ are discussed in Table 2. Experimental studies of the bio-compatibility (inertness) of covered metal stents suggested polypropylene mesh to be the best covering agent for metal stents in the trachea[16].

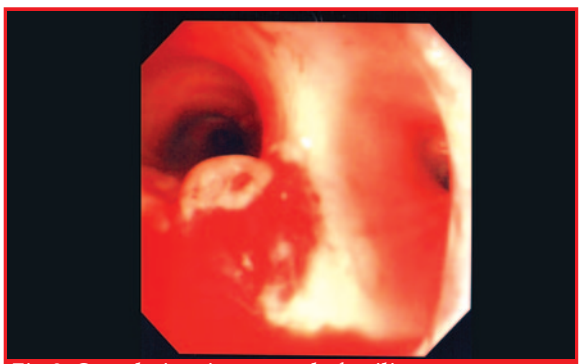

Fig. 2 Granulation tissue at end of a silicone stent

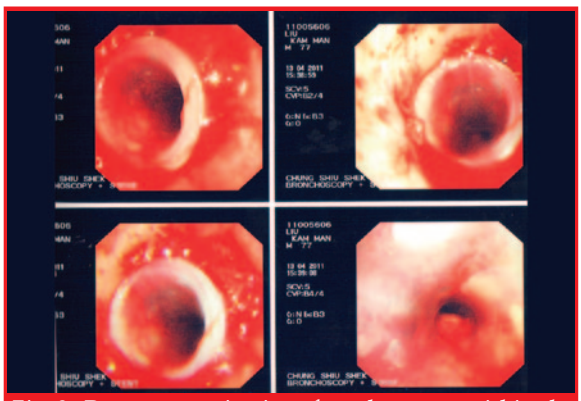

Fig. 3 Dumon stent in situ after placement within the tracheal tumour in Patient 1.

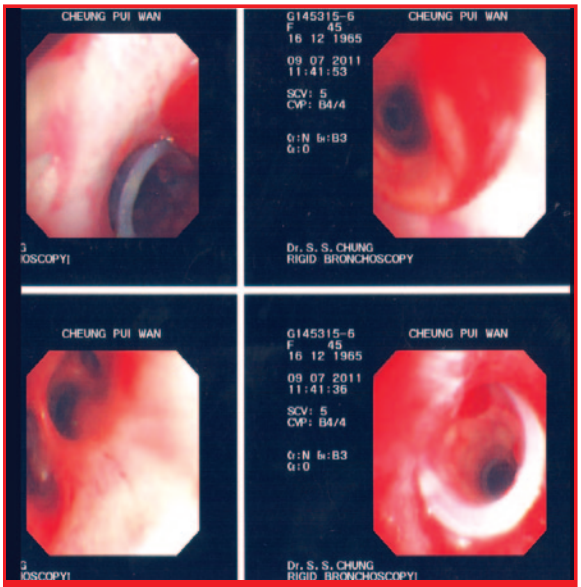

Fig. 4 Dumon stent in situ after placement in the proximal right main bronchus in Patient 2

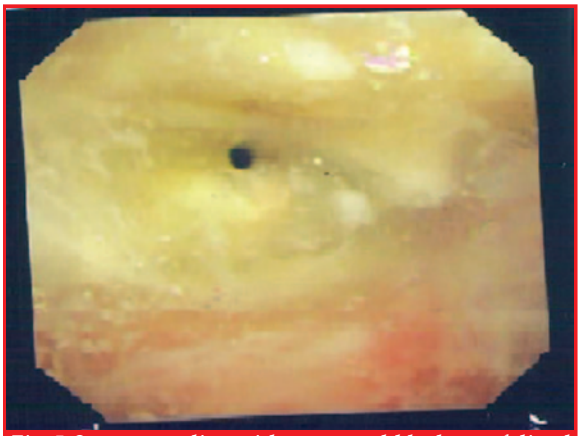

Fig. 5 Sputum pooling with near-total blockage of distal end of tracheal stent

Illustrative examples for the use of airway stenting

Example 1: Malignant airway obstruction

A 77 year-old ethnic Chinese tourist developed haemoptysis and shortness of breath while travelling in Mainland China. He had a history of carcinoma of thyroid diagnosed in his adopted homeland: Holland, and for which he had refused treatment there. Physical examination showed stridor and fibreoptic bronchoscopic examination revealed near total obstruction of the upper trachea by an endobronchial tumour at around 1.6 cm below the vocal cords. Urgent rigid bronchoscopy with dilatation and insertion of a Dumon stent was done the next day under general anaesthesia. A 13 mm x 40 mm silicone stent was placed across the dispelled tumour at 1.5 cm from the vocal cords down to the patent trachea (Fig 3). His symptoms improved and he recovered uneventfully. Shortly afterwards, he flew back to Holland for further palliative care.

Discussion on the choice of airway stents

In this patient, the use of a silicone stent was wise for the following reasons:

1. Paradoxically, flexible bronchoscopy is risky while rigid bronchoscopy is safe in imminent total airway obstruction. In emergencies and during desperate situations arising from an obstructive endobronchial tumour, rigid bronchoscopy is useful in re-establishing a patent airway by direct coring and intubating through the dispelled tumour, into the patent distal airway; handling of massive haemoptysis is possible if so happens.
2. Covered silicone stents avoid the in-growth of tumour tissue between the metal wires or scaffold.
3. Future retrieval and deployment of a more lengthy stent is feasible if the tumour has grown along the airway path.

Different considerations ought to be given to massive anterior mediastinal tumours with extrinsic obstruction of the airways[3]. General anaesthesia is best avoided as the patient may deteriorate rapidly when muscle relaxant is given. A metal stent (covered or uncovered) is advisable, serving as prophylactic interim stenting[17] before external radiotherapy. A change-over to silicone stent can then be considered within six weeks of deployment of metal stent if life expectancy allows.

Example 2: Post Pneumonectomy (Left) Syndrome[18,19]20 years after pneumonectomy for destroyed lung and dynamic right main bronchial stenosis

A 46 year-old lady had a remote history of pulmonary tuberculosis and endobronchial tuberculosis followed by irreversible left main bronchial stenosis and destroyed left lung, and subsequently further complicated by iatrogenic broncho-oesophageal fistula[20], leading to left pneumonectomy and oesophagectomy 26 years earlier. She presented with expiratory stridor and exercise limitation. Computerised Tomography (CT) of the trachea looked normal except for slight tapering of the distal trachea. The patient was suspected to have dynamic obstruction of the right main bronchus secondary to compression anteriorly by the stomach and pulmonary artery[21]; and posteriorly by the vertebral column. The diagnosis was confirmed by rigid bronchoscopy. A 13 mm x 40 mm Dumon stent was placed beyond the carina in the proximal right main bronchus just before the take-off of the right upper lobe bronchus (Fig. 4). Distal airways were confirmed to be patent. Stridor was relieved, and exercise tolerance improved.

Discussion on the choice of airway stents

Bare metal stents are usually more advisable for those with a limited life expectancy, whereas in benign conditions, they may run the longer-term risk of erosion into a blood vessel. Silicone stents allow adjustments in position and subsequent removal/replacement in benign conditions. They are generally preferred to metal stents besides being less expensive.

An argument against such consideration has been advocated in the case of long-segment tracheomalacia where the concern of life-long blockade of mucociliary clearance[7] in nearly the entire trachea is of considerable infection risks. Either the silicone stent is removed at an interval or failing that; is converted to a permanent metal stent.

In centres which specialise in managing relapsing polychondrits[22] and children's tracheomalacia, silicone stents could be placed first as a therapeutic trial to determine the best length and position for the tracheal stent (to leave maximal unstented length). Then conversion to a permanent uncovered metal wired stent[23,24] is done subsequently. Use of an uncovered metal stent allows incorporation of the stent into the mucosal wall and preserves the mucociliary action[24]. Also the metal stent has more effective lumen for stents of the same size especially in children. In the majority of adult patients[25], and those with benign short segment tracheal stenosis at all ages ,silicone stents are still favoured over metal stents[26].

Airway stents in the horizon

Further improvements of currently available airways stents can arrive in the form of tailored-made stents for best conformity to the stenotic anatomy and/or angulated stents to fit the carina. Recently, the biodegradable stents[12] which eliminate the need for removal are introduced as in stents for post transplant anastomosis splintage and support. In children, absorbable stents allow growth of the airway[27].

Conclusion

There has been a long history of proven efficacy in the use of stenting of obstructed or collapsible major airway (1.5 cm from the vocal cord down to 3.5 cm distal to the carina) as an intermediate term palliative treatment for airway stenosis. Where definitive surgical intervention is not feasible, airway stenting provides the only option for improving airway patency. Airway stenting is a valuable tool in providing minimally invasive treatment for palliation or as a bridge to definitive therapy[8,28] such as radiation therapy. Its role in benign conditions is more controversial because of its potential complications and the need for long-term follow-up.

In considering the option of airway stenting, the clinician needs to exercise prudent judgement on suitability of the clinical condition and on the benefits versus risks and complications of airway stenting. The clinician also needs to make a thorough assessment of the clinical problem preoperatively. Preoperative CT scan or CT fluoroscopy is helpful[29,30]. Intraoperatively, prudent selection of the size and type of stents with expert deployment is important. As most of these patients are in unstable and critical conditions with complex co-morbidities, meticulous preoperative planning and good contingency backup are keys to success.

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Dermatological Quiz

Dermatological Quiz

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Private Dermatologist

Dr. Lai-yin CHONG

Fig. 1: Patch of alopecia at (a) vertex & (b) left parietal scalp

This 6-year-old girl was brought by her mother because of gradual hair loss in recent few months. She had no complaints about the hair loss. Her mother noticed that her daughter had frequent scratching which she attributed to itchiness at the scalp. Her past health was good and there were no noticeable emotional problems so far. On examination, she had two patches of non-scarring non-inflammatory alopecia distributed at the vertex and left parietal scalp respectively (Fig. 1a & 1b). There were broken hairs of different lengths. No exclamation hair can be seen.

Questions:

1. What is your provisional diagnosis?
2. What are the main differential diagnoses of this condition?
3. What underlying associated disorder should be searched for?
4. How do you manage this patient and what is the prognosis?

(See P.38 for answers)

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Bronchial Thermoplasty for Severe Persistent Asthma

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Introduction

The societal burden of asthma is daunting. In the United States, approximately 18 million adults are diagnosed with asthma, and up to 10% of patients have the severe persistent type, i.e., experiencing frequent symptoms despite maximal medical therapy.[1] Globally, there is a worsening trend of asthma with respect to morbidities and economic hardships. Approximately 300 million people, both adults and children, have asthma. The Global Initiative for Asthma (GISA) outlined a six-point patient-centred management plan aimed at patient education, prevention, and treatment.[2] Despite these efforts, significant morbidity and mortality are attributed to adults greater than 45 years old, and the degree of burden is directly proportional to the severity of symptoms. Therefore, it is imperative that in parallel to programmes that are focused on patient education and prevention, new treatment paradigms are needed to manage patients with severe and uncontrolled asthma.

Asthma is defined as a chronic inflammatory disorder of the airway causing variable and reversible obstruction of airflow. Symptoms include dyspnoea, chest tightness, wheezing, and coughing. Nocturnal symptoms can be severe, and exacerbations can be triggered by inhalation of aeroallergens, noxious stimulants, or respiratory infections.[3] The consequences of uncontrolled asthma are significant, affecting functional and emotional aspects of quality of life. A minority of patients require frequent lost-days from work, emergency room visits, or hospitalisations. In the most severe incidences, complications of asthma may include the admissions to intensive care units with mechanical ventilation, or even death.[4]

If chronic airway inflammation is not adequately managed, remodelling will occur and irreversible symptoms may ensue. Furthermore, hypertrophy of smooth muscle layers lead to more severe symptoms and morbidities due to further worsening of airway resistance.[5] While standard therapy consisting of inhaled corticosteroids, long acting beta-agonists, leukotriene modifiers are paramount in controlling and maintaining asthma stability, a minority of patients with the severe and persistent type may require frequent oral systemic corticosteroids or, if appropriate, anti-IgE therapy (omalizumab) for advanced control.[6]

Bronchial Thermoplasty

Bronchial Thermoplasty (BT) is a new technology approved by the United States Food and Drug Agency (FDA) in 2010 for the treatment of patients with severe persistent asthma. The procedure utilises controlled application of radiofrequency energy directly onto the airway mucosa utilising a bronchoscope, the resultant thermal energy causes ablation of submucosal airway smooth muscle layers. Subsequently, there is atrophy of the smooth muscles, thereby reducing airway constriction during exacerbations. The procedure involves using a catheter inserted into a 2.0mm or greater working channel of the bronchoscope (figure 1). The distal end of the catheter is a metallic radial tip that is expandable (figure 2). When full circumferential contact is achieved with the metallic end, the controller delivers 10 seconds of controlled thermal energy at 60°C (figure 3). All airways, except for those of the right middle lobe, are treated with the most distal sub-segments (approximately 3 mm) reached by the bronchoscope. Complete treatments are divided into three sessions three weeks apart, separating among the right lower lobe, the left lower lobe, and bilateral upper lobes. Each session takes approximately one hour, and most patients tolerate the procedure under conscious sedation without the need for general anaesthesia. More than 90% of the patients who undergo the procedure should be able to be discharged home the same day.

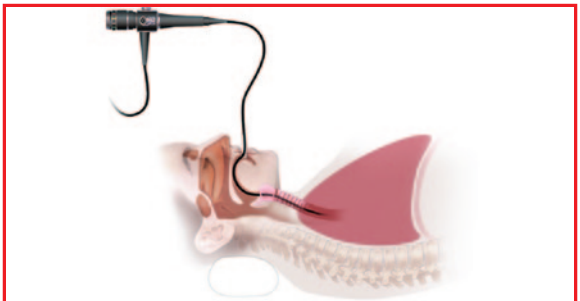

Figure 1. Flexible bronchoscope inserted via oral route. Bronchial thermoplasty catheter deployed into segmental bronchus (Courtesy of Asthmatx Inc. and Boston Scientific Corporation)

Figure 2. Left panel. Catheter depicting expandable metallic array at distal end and operator handle at the proximal end. Right Panel. Controller (Courtesy of Asthmatx Inc. and Boston Scientific Corporation)

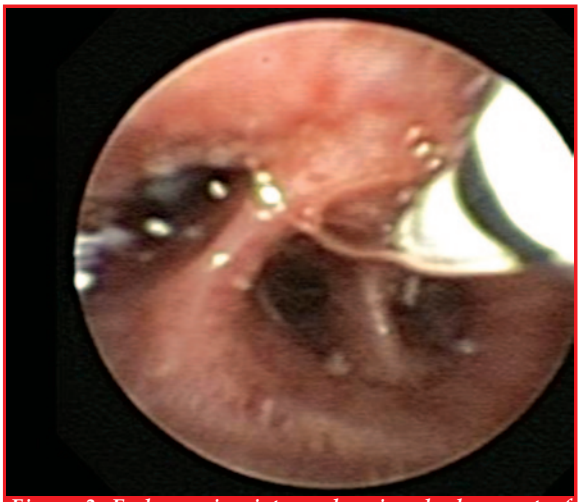

Figure 3. Endoscopic picture showing deployment of catheter into segmental airway. The catheter is marked at the distal end with 5 mm increments to assess airway length or distance treated.

Case Presentation

A 45 year old woman was referred for refractory asthma. She was a mother of two, 6 and 8, and her symptoms were limiting her ability to care for them. Her asthma was diagnosed 10 years ago, and it was originally managed with fluticasone and serevent combination inhaler for moderate persistent symptoms. She reported having almost daily symptoms of chest tightness and night time wheezing. She required rescue inhaler on a daily basis and visited her pulmonologist three times over the past 12 months. She was prescribed systemic oral corticosteroids twice during the time period. Furthermore, she was prescribed omaluzimab for elevated IgE level 6 months ago but had minimal improvement of her symptoms.

Her pulmonary function tests showed moderate obstructive airflow limitation with positive bronchodilator response. The forced expiratory volume (one second) is 2.06 litres, 68% of predicted and the FEV1/FVC ratio is 67% of predicted. There was also moderate air-trapping with RV/TLC ratio of 123% of predicted. The diffusion capacity was preserved. Additional diagnostic studies included computed tomography of the chest, which demonstrated mild bronchial wall thickening and mosaic attenuation consistent with air-trapping. There were no other significant abnormalities.

Despite her good compliancy with her asthma management programme, the patient still was experiencing daily symptoms. After evaluations by otolaryngology and gastroenterology, sinusitis and acid reflux were ruled out, respectively. The patient was deemed a good candidate and underwent bronchial thermoplasty. After the first session that treated the right lower lobe, the patient described increased chest tightness and phlegm production for the first 48 hours. Her symptoms returned to baseline after one week. Three weeks after the first BT treatment, she underwent the second session and the left lower lobe was treated. Her symptoms remained stable and by the time she underwent her third session, which was treatment of the bilateral upper lobes, she felt subjectively better and reported not requiring rescue bronchodilator so frequently. The patient was able to participate in regular family activities six months after initial treatment. She also reported improvement of self-esteem and had a much better outlook in her quality of life.

Clinical Applications and Safety profiles

Bronchial thermoplasty is a novel approach and a FDA approved technology for the treatment for severe persistent asthma. The procedure is not intended for patients with mild to moderate asthma, or patients who have not demonstrated compliancy with standard medical regimens. It is also important to remind both potential patients and referring physicians that BT is intended to result in better-controlled asthma, but it is not regarded as a curative treatment. All patients who undergo BT procedures are still required to be followed up by their general pulmonary physicians to monitor asthma stability on maintenance medications. To date, there have been over four major clinical trials with published data for over 275 patients who underwent BT[7,8,9,10]. More than 800 procedures have been performed among 30 institutions around the world.

The pivotal trial, the Asthma Intervention Research (AIR2) study, was published in 2010, with almost 300 patients with severe persistent asthma randomised to either received BT or sham controlled in a 2:1 ratio.[8] The control group of patients underwent bronchoscopy matching the treatment group, but the controller did not apply actual thermal energy, i.e., a sham-control. The reason for the sham group was due to the primary outcome being the AQLQ, or asthma quality of life questionnaire, which may yield significant biases if conducted to patients who are aware of their trial assignment. The AQLQ is a validated questionnaire consisting of 32 questions that assesses asthma related symptoms quantitatively in four domains: physical, emotional, social and occupational.[11] A change of more than 0.5 is considered meaningful if the questionnaire is administered before and after asthma treatment. In AIR2, 79% of the treated group vs 64% of the sham group had clinically meaningful improvement. The difference was statistically significant. Furthermore, secondary safety endpoints showed that there were 32% reduction in asthma exacerbation during the 12-month follow up period, 84% reduction in emergency room visits for asthma related symptoms, 73% reduction in hospitalisations, and 66% reduction in data in days lost from work or school.[8]

Controversies

Bronchial thermoplasty is a novel approach to the treatment of severe persistent asthma. While clinical trials have shown favourable outcomes, including efficacy and safety profiles, long-term outcomes are still needed to conclude that BT should be incorporated as a standard of care option. Although longer term efficacy has been published, showing that improvement of clinical variables persist to two years, and safety profiles are observed to 5 years[12,13], longer post-FDA approval

data are needed. Furthermore, the exact mechanisms of how BT actually improves asthma symptoms by treating small airways smooth muscles are still not understood. Some have postulated that disruption of smooth myosin function with protein denaturation being responsible for attenuation of airway constrictions during exacerbations.[14] Moreover, there are no data identifying which subgroups, either by physiologic, clinical, or radiographic criteria, are most likely to respond to BT favourably.

The AIR2 trial also demonstrated that 64% of the sham-controlled patient group derived clinical benefits from no thermal ablation. Therefore, there may be yet undefined placebo effects that are seen in the self-driven patients who enrolled in the trial, either through recall-bias with the outcome variables or through increased compliancy of standard medical therapy.

Finally, although bronchial thermoplasty should not require significant additional training for a pulmonologist who performs frequent bronchoscopies, the management of patients with severe asthma requires a team approach for selection of appropriate candidates, peri-procedural management, as well as short and long term clinical follow-up. The AIR2 trial did not show that patients were able to discontinue their maintenance medications (bronchodilators), and no significant changes were seen in major physiologic variables such as FEV1 or RV/TLC.[7] Most patients who underwent BT did feel "flare" symptoms immediately after each procedure and the symptoms may last for many days. A smaller proportion of patients did experience adverse side effects that required a short-term hospitalisation. Other adverse effects, although modest, were associated with the thermoplasty group for the initial 3 months (and not at 12 month follow-up) after treatment included respiratory tract infections, wheezing, atelectasis and haemoptysis.[7] Therefore, pulmonologists with extensive bronchoscopy experience and/or training should perform bronchial thermoplasty in a tertiary referral centre, and in the context of asthma clinics with specialised support staff.

Conclusion

Bronchial thermoplasty is an exciting and promising new tool to treat severe persistent asthma. In properly selected patients, there is clear evidence that it helps to improve the quality of life in patients who are compliant with their medications. Current data also show favourable safety profiles. Longer-term data are needed to incorporate it into part of the standard management paradigm.

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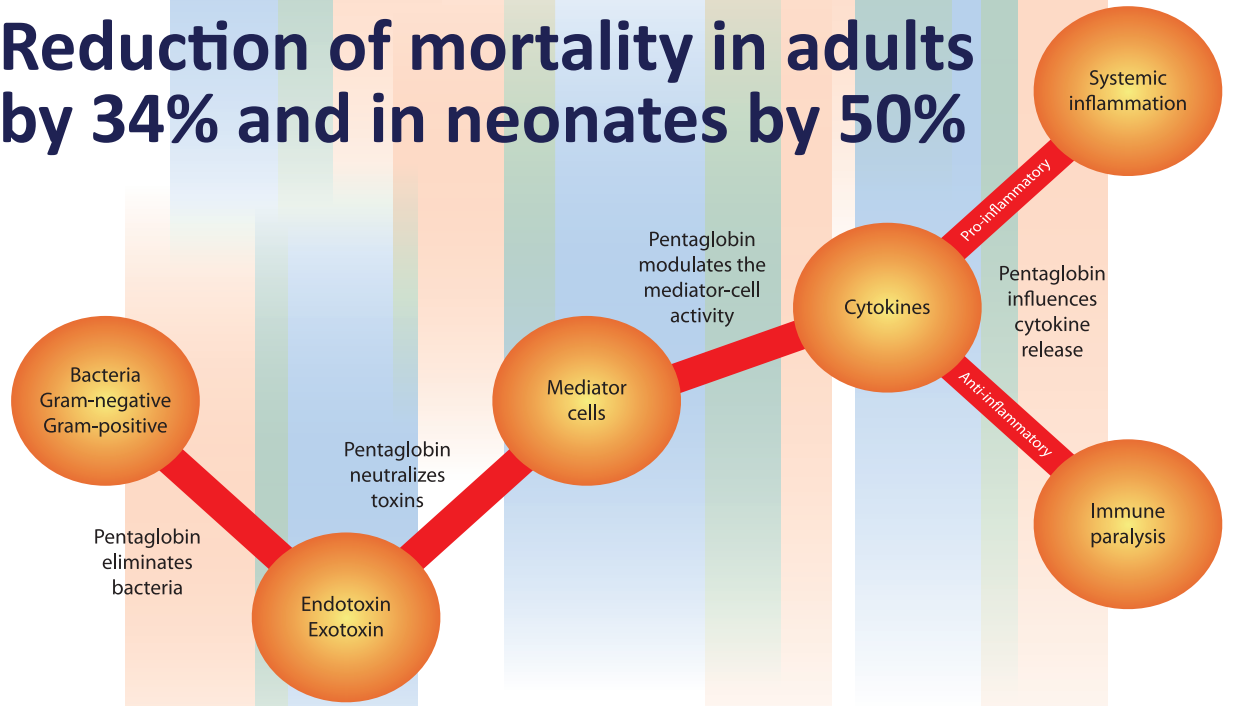

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What we can learn from plum blossoms: An account on Professor Richard Yu's charity photo exhibition for the Hong Kong Breast Cancer Foundation

Dr. Patrick CP LAU

Specialist in Medical Oncology

The Lincoln House of Taikoo Place held one of the most spiritually stimulating charity photo exhibitions—BLOOM, on 8th through 18th March 2011. Thirty-six plum blossom photographs shot through the lens of one of the most prominent physicians in Hong Kong were exhibited and sold for charity dedicated to the Hong Kong Breast Cancer Foundation, for the betterment of lives of women suffering from a devastating disease. There is a very important lesson to learn from this charity event, and from a great master of internal medicine, Professor Richard Yu, who has lent his generosity to showcase his favourite flower to the public at this first solo gallery of his.

Plum blossom never strikes as a flower of flamboyance. One may easily overlook her great beauty if one does not pause for a second to do some thinking. Plum blossom blooms vibrantly in the coldest winter time, and is also honoured as "the first flower of the year". While other flaunting flowers shrivel and wither under adverse conditions, plum blossom is the one that grows with dignity, expresses her grace and glory in the wind and snow. Her resilience, perseverance and strength symbolise the spirit of the Chinese people, making her the national flower of our nation and our race. In essence, plum blossom is one of the most beloved flowers with character and spirit. Under Professor Yu's camera, they look particularly sophisticated when depicted with a mixed touch of realism and impressionism.

Plum blossom teaches us not to focus on the retinal beauty of things. True beauty does not manifest until the visual message passes through the optic nerve, optic tract, occipital lobe, and then, to the deeper part of our brains, and via the autonomic nerves to reach our hearts, where our spirits reside. I cannot agree more with Professor Yu—'**Doctors do not heal the sickness, but the person. We must have genuine goodness and empathy; we must always encourage patients to face adversity.**' It is particularly meaningful when Professor Yu dedicated his plum blossoms to benefit people suffering from cancer, and yes, what a real, real adversity this group of patients are under. This is exactly why I picked medical oncology as my profession, as I want to take care of people who are under such an adversity. Unimaginably tragic stories are what I see every day. It is more important for an oncologist to master the art of helping cancer patients bloom like a plum blossom at a time of great difficulties than learning the most elegant target therapies.

Indeed, Professor Yu has helped many cancer patients through a variety of ways, despite being a master in nephrology. With his support, medical oncology grew from an initially incompletely-understood medical subspecialty to now a well-established, well-recognised medical subspecialty that is based on translational and clinical research advances. I myself had his help and advice when I was sorting out my training schedule (though I don't think Professor Yu recalls helping me before). I must take this opportunity to convey Professor Yu's message to all new generation doctors (including myself) who can learn a lesson from our grand senior—'**In my several decades of working in the medical field, I have always believed that the virtues of being a doctor are more important than the profession itself**'. Especially for oncologists, empowering cancer patients with the strength to sail through a catastrophic condition with love and prayer is more important than trying too hard to defy what nature is meant to be.

Public Talk on Skin Allergy

On Dec 11, 2011, the Federation's Lecture Hall was packed with friends and joyful sharing during the Skin Allergy Public Talk.

We were very glad to have 3 guest speakers – Dr. George Chow, Dr. Helen Chan and Dr. Johnny Chan joined us to deliver the Talk to the audience. The Talk was a practical yet relaxing one which gave the public audience much useful information on why allergy problems deserve more attention and taught them public audience to pay more attention on daily hygiene habits and introduced general and specific treatments. Meanwhile, we wish to thank Nycomed for being the sponsor of the Talk.

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20 Feb 2012	Dr. Jadis Blurton	Helping Children under Stress : Divorce, Death and Chronic Illness
27 Feb 2012	Ms. Ceilidh Halloran	A therapeutic framework for addressing Burnout in Health Professionals
5 Mar 2012	Mr. John Shanahan	Learning and Attentional Difficulties in Children and Teenagers
12 Mar 2012	Dr. Nia Pryde	Working Therapeutically with Sexual and Relationship Dysfunction

Time : 7:00 p.m. – 8:30 p.m.
Venue : Lecture Hall, 4/F., Duke of Windsor Social Service Building, 15 Hennessy Road, Wanchai, Hong Kong
Language Media : English
Course Fee : HK$750 (6 sessions)
Certificate : Awarded to participants with a minimum attendance of 70%
Enquiry : The Secretariat of The Federation of Medical Societies of Hong Kong
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Medical Diary of January

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	* HKMA Council Meeting 3	4	5	6	* HKMA Youth Committee – Singing Competition 7
* HKMA Youth Committee – Joint Professional Singing Competition 8	9	* HKMA Kowloon West Community Network – Management of Atopic Dermatitis * FMSHK Officers' Meeting 10	11	* HKMA Hong Kong East Community Network – Treating Rheumatoid Arthritis in the New Decade * HKMA Structured CME Programme with Hong Kong Sanatorium & Hospital Year 2012 – Basic principles of electrodiagnosis and its application in the management of patients with limb pain, numbness and weakness 12	13	* Refresher Course for Health Care Providers 2011/2012 * HKMA 7th Sports Night 14
15	16	17	18	* HKMA Kln East Community Network – Update in Lipid Management in High Risk Patient Groups * FMSHK Executive Committee meeting 19	20	21
22	23	24	25	26	27	28
29	30	31				

Date / Time	Function	Enquiry / Remarks
3 TUE 8:00 pm	**HKMA Council Meeting** Organiser: The Hong Kong Medical Association, Chairman: Dr. Kin CHOI, Venue: HKMA Head Office, 5/F, Duke of Windsor Social Service Building, 15 Hennessy Road, Hong Kong	Ms. Christine WONG Tel: 2527 8285
7 SAT 12:00 nn	**HKMA Youth Committee – Singing Competition** Organiser: The Hong Kong Medical Association, venue: Neway CEO	Miss Tracy GUO Tel: 2527 8285
8 SUN 1:00 pm	**HKMA Youth Committee – Joint Professional Singing Competition** Organiser: HKMA; HK Institute of Certified Public Accountants, HK Dental Association; Law Society of HK, HK Institute of Surveyors, Venue: Grappa's Cellar (Basement, Jardine House, Central)	Miss Tracy GUO Tel: 2527 8285
10 TUE 1:00 pm	**HKMA Kowloon West Community Network – Management of Atopic Dermatitis** Organiser: HKMA Kowloon West Community Network, Speaker: Dr. LO Kuen Kong, Venue: Crystal Room I-III, 30/F., Panda Hotel, Tsuen Wan, N.T.	Miss Candice TONG Tel: 2527 8285
8:00 pm – 10:00 pm	**FMSHK Officers' Meeting** Organiser: The Federation of Medical Societies of Hong Kong, Venue: Gallop, 2/F., Hong Kong Jockey Club Club House, Shan Kwong Road, Happy Valley, Hong Kong	Ms. Sonia CHEUNG Tel: 2527 8898 Fax: 2865 0345
12 THU 1:00 pm	**HKMA Hong Kong East Community Network – Treating Rheumatoid Arthritis in the New Decade** Organiser: HKMA Hong Kong East Community Network, Chairman: Dr. YOUNG Ying Nam, Dominic, Speaker: Dr. CHEUNG Tak Cheong, Venue: HKMA Head Office (5/F., Duke of Windsor Social Service Building, 15 Hennessy Road, Hong Kong)	Miss Candice TONG Tel: 2527 8285 1 CME Points
2:00 pm	**HKMA Structured CME Programme with Hong Kong Sanatorium & Hospital Year 2012 – Basic principles of electrodiagnosis and its application in the management of patients with limb pain, numbness and weakness** Organiser: The Hong Kong Medical Association, Speaker: Dr. CHOW Chi Ping, Alex, Venue: The Hong Kong Medical Association Central Premises, Dr. Li Shu Pui Professional Education Centre, 2/F., Chinese Club Building, 21-22 Connaught Road, Central	HKMA CME Department Tel: 2527 8285 1 CME Points
14 SAT 2:30 pm	**Refresher Course for Health Care Providers 2011/2012** Organiser: The Hong Kong Medical Association, Speaker: Dr. CHAN Wai Lam, Venue: OLMH	HKMA CME Department Tel: 2527 8285 2 CME Points
7:00 pm	**HKMA 7th Sports Night** Organiser: The Hong Kong Medical Association, Speaker: Dr. PONG Chiu Fai, Jeffrey, Venue: Wanchai Ho Choi Banquet And Seafood Restaurant	Miss Alice TANG Tel: 2527 8285 0.5 CME Points
19 THU 1:00 pm	**HKMA Kln East Community Network – Update in Lipid Management in High Risk Patient Groups** Organiser: The Hong Kong Medical Association, Speaker: Dr. KO Wai Chin, Venue: East Ocean Seafood Restaurant, Tseung Kwan O	Mr. Alan LAW Tel: 25278285 1 CME Point
8:00 pm – 10:00 pm	**FMSHK Executive Committee meeting** Organiser: The Federation of Medical Societies of Hong Kong, Venue: Council Chamber, 4/F, Duke of Windsor Social Service building, 15 Hennessy Road, Wanchai, Hong Kong	Miss Sonia Cheung Tel: 2527 8898 Fax: 2865 0345

Meeting

6/1/2012	**Joint Surgical Symposium – Advances in Esophageal and gastric Surgery** Organiser: Department of Surgery, The University of Hong Kong and Hong Kong Sanatorium & Hospital , Venue: Hong Kong Sanatorium & Hospital, Time:8:00 – 9:00am, Chairman: Dr. Angus CW Chan, Speakers: Professor Simon Law and Professor Chu Kent-Man, CME Accreditation: 1 point (Active), Enquiry: Department of Surgery, Hong Kong Sanatorium & Hospital, Tel: (852) 2835 8698, Fax: (852) 2892 7511
9/1/2012	**A patient with labile blood pressure upon micturiction** Organiser: Hong Kong Urological Association, Venue: Multi-disciplinary Simulation and Skills Centre, 4/F, Block F, QEH, Time: 7:30-8:30pm, CME Accreditation: 1 point The College of Surgeons of Hong Kong, Registration & Enquiry: Dr. HUNG Hing Hoi. Ms. Tammy Hung, Tel: (852) 2958 6006 / (852) 9609 6064, Fax: (852) 2958 6076/ 8344 5115
11/1/2012	**Hong Kong Neurosurgical Society Monthly Academic Meeting – Cortical Spreading Depression** Organiser: Hong Kong Neurosurgical Society, Venue: Seminar Room, Ground Floor, Block A, Queen Elizabeth Hospital, Time: 7:30am, CME Accreditation: 1.5 points, Registration & Enquiry: Dr. Gilberto Leung, Tel: (852)2255 3368, Fax (852) 2818 4350
14/1/2012	**Hong Kong Surgical Forum – Winter 2012** Organiser: Department of Surgery, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Queen Mary Hospital & Hong Kong Chapter of American College of Surgeons, Venue: Underground Lecture Theatre, New Clinical Building, Queen Mary Hospital, Pokfulam, Hong Kong, Registration & Enquiry: Forum Secretary, Hong Kong Surgical Forum, Tel: (852) 2819 9691 / (852) 2819 9692, Fax: (852) 2818 9249, E-mail: hksf@hku.hk, Web-site: http://www3.hku.hk/surgery/forum.php
19/1/2012	**Clinical Meeting of HK Thoracic Society** Organiser: Hong Kong Thoracic Society, Venue: LG1, Lecture Room, Ruttonjee Hospital, Registration & Enquiry: Dr. Fanny Wai San KO (PWH) & Dr. Arthur Chun Wing LAU (PYNEH), Tel: (852) 2632 2785, Fax: (852) 2637 5396
19/1/2012	**Clinical Meeting of American College of Chest Physicians (HK & Macau Chapter)** Organiser: Hong Kong Thoracic Society, Venue: LG1, Lecture Room, Ruttonjee Hospital, Registration & Enquiry: Dr. Fanny Wai San KO (PWH) & Dr. Arthur Chun Wing LAU (PYNEH), Tel: (852) 2632 2785, Fax: (852) 2637 5396

Answer to Dermatological Quiz

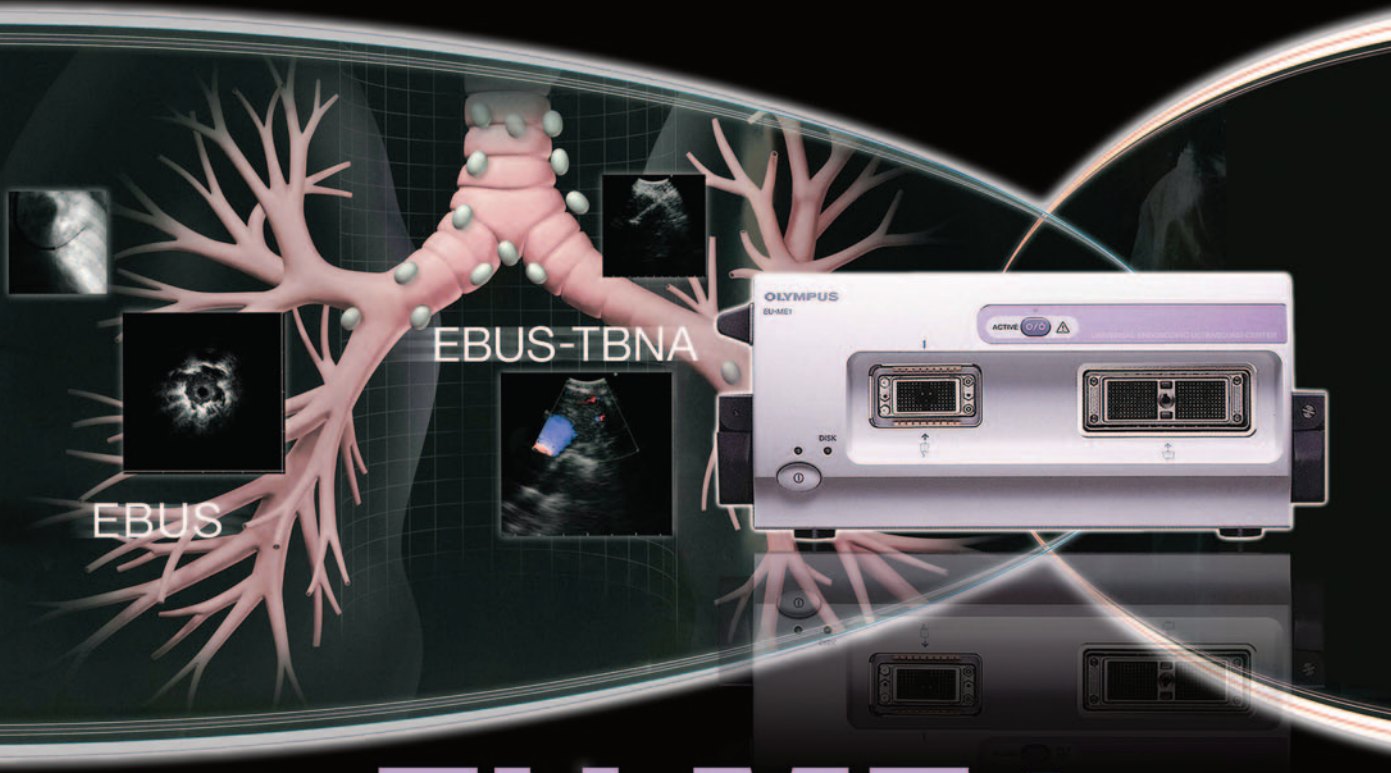
1. Trichotillomania (Greek for "hair-pulling madness"). The diagnosis is based on the pattern of non-scarring, non-inflammatory patchy alopecia with sharply defined borders and geometrical shape. Hairs are often broken at different lengths. There may or may not be a history of hair pulling on direct questioning. This is a compulsive disorder with repetitive hair manipulations by the patient, often non-intentional and habitual without the patient's own awareness. It is usually a concern of the parents rather than the patient.

2. Very often it is misdiagnosed as alopecia areata, especially the diffuse type.
   A high index of suspicion for the diagnosis is essential and it should not be confused with malingering. Other conditions that may mimic trichotillomania include traction alopecia, chronic telogen effluvium, tinea capitis, monilethrix and alopecia mucinosa.

3. In dermatological clinics, trichotillomania is usually seen in children and early adolescents. Though primarily a psychiatric disorder, dermatologists are more likely to see these patients before psychiatrists. Despite trichotillomania is attributed to underlying psychiatric disorders, children seen in dermatological clinics are not necessarily more nervous or have deep-rooted mental disorders, though some of them may have anxiety or emotional problems at home or in school. However, adults with this condition usually have deep obsessive-compulsive behaviour.

4. Management of this psychodermatosis is difficult. Parents who have not witnessed the hair pulling by their child often refuse to believe that it is self-inflicted. The physician should ensure that the parents fully understand the nature of the alopecia before any referral to a psychiatrist is possible. In practice, behaviour modification is considered as most useful. Drug treatments (e.g. with selective serotonin reuptake inhibitors) and psychoanalytical treatment are usually disappointing. The age of onset influences the course and prognosis. In general, children have a time-limited disorder and good prognosis. Adolescents and adults have more severe disease, and the prognosis should be considered as guarded.

Dr. Lai-yin CHONG
MBBS(HK), FRCP(Lond, Edin, Glasg), FHKCP, FHKAM(Med)
Private Dermatologist



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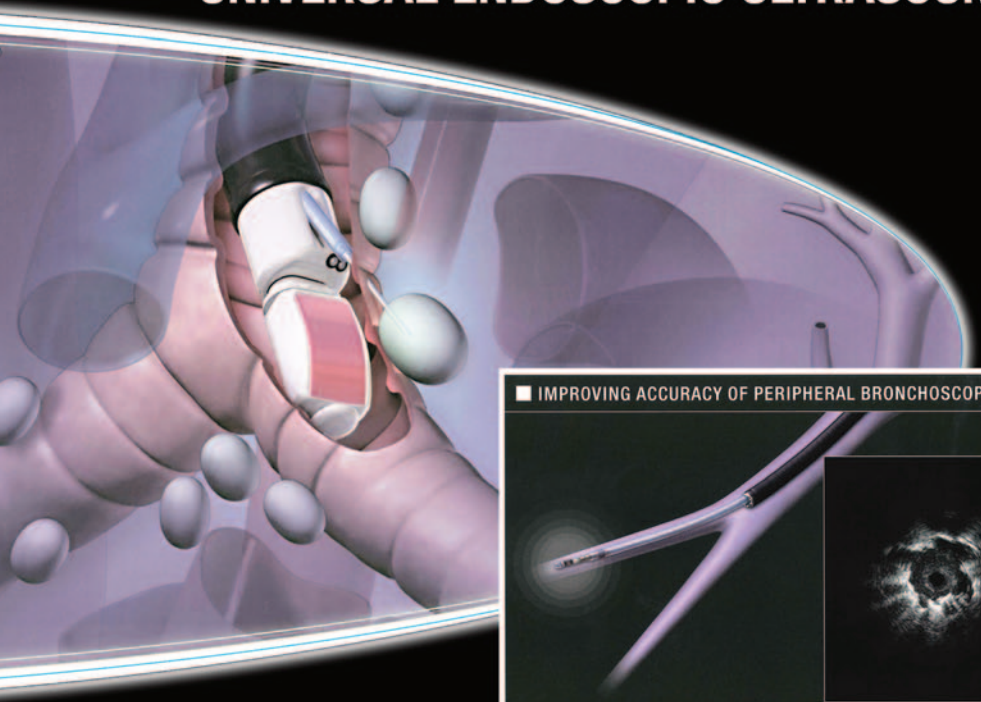

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