

# Rigid bronchoscopy in mainland China: present state and perspectives

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Rigid bronchoscopy (RB) was firstly used in Europe almost 120 years ago (1). Chan-Yeung (2) detailed the development history of RB and flexible bronchoscopy (FB) and emphasized the lower utilization rate of RB at present than that in the past world-wide. We agree that the current utilization of RB is significantly less frequent than that of FB all over the world, yet as an important therapeutic tool, RB is not only growing, but also becoming a standard choice in a certain sense.

Overall, we agree with many viewpoints proposed by Chan-Yeung (2), but the advantages of RB have not been presented comprehensively. To expand further, RB possesses many advantages in managing airways disease: (I) airway stenting with silicone or custom stents; (II) removal of complex airway foreign bodies, including long-term embedded metallic stents; (III) management of complex and severe central airway stenosis; (IV) bronchoscopic procedures with high-risk of massive hemoptysis; (V) management of massive hemoptysis, and (VI) being preferred in hemodynamically unstable patients with superior control of the airways either in central or peripheral examination issues. However, the indication of transtracheal puncture of the carinal lymph nodes using RB mentioned by Chan-Yeung (2) has been completely replaced by FB with conventional transbronchial needle aspiration (C-TBNA) as well as endobronchial ultrasound guided transbronchial needle aspiration (EBUS-TBNA) (3,4).

The development of bronchoscopy in mainland China, which is different from that in the western countries, can

be roughly divided into three historical stages. During the first stage from the mid-1980s to 2004, almost all Chinese bronchoscopists exclusively used FB. RB was rarely seen in adult bronchoscopic procedures and only sporadically adopted for pediatric airway foreign body removal by otolaryngologists (5). At the second stage from 2005 to 2012, as the advantages of RB in therapeutic bronchoscopic procedures were gradually recognized, some Chinese pulmonologists traveled to Europe to observe RB procedures, but the utilization rate of RB still remained low. A survey on the equipment and techniques applied in bronchoscopy suites during the period in 54 hospitals in mainland China demonstrated that although 40.7% of the institutions possessed RB equipment, but its application frequency remained low, with the average annual cases less than 15 in each hospital (6).

The third stage of RB development in China is from 2013 until the present day. At this stage Chinese pulmonologists began to have access to a standardized training program of interventional pulmonology (IP), including RB, in the United States. As the first kind of airway silicone stent (Dumon<sup>®</sup> silicone stent, Novatech, France) became available in Chinese market in March of 2014, more and more RB procedures with silicone stenting have been successfully performed in large-scale bronchoscopy centers (5,7,8). The increased use as well as the subsequent increased benefits for patients has attracted a greater number of chest physicians to RB throughout China.

In mainland China, a large number of patients have

complications of central airway stenosis, such as complex tracheobronchial stenosis due to airway tuberculosis, and all of them are the potential beneficiaries of RB procedures. With the development of IP, there will be more significant integration of endoscopic respiratory surgery and advanced procedures combining RB and FB, thereby benefiting the patients in China.

However, RB in mainland China still faces many challenges. Firstly, there is no specialized training program for IP fellowships in China, so it is difficult for Chinese pulmonologists to get standardized training. Secondly, the pulmonologists who perform RB procedures without standardized training increase the risk of severe complications. Finally, the population of China is much larger as compared with that in western countries and this makes differences in many aspects. So more effective, cheaper, faster, and safer procedures are needed in China. We strongly suggest that complex procedures such as RB should be restricted to regional centers of excellence due to high requirements of experience and teamwork.

Presently, despite being an “ancient” technology, RB still cannot be replaced in removing difficult foreign bodies, placing silicone stents, or treating critical central airway stenosis. It is important for us to understand the effectiveness and importance of this “ancient” technology in managing today’s patients. Modern bronchoscopic procedures should always be patient-focused, so they are required to be more efficient, safer, minimally invasive, and economically feasible. Experts in RB are obliged to further optimize current RB procedures and instruments, so as to perform complex procedures in simpler ways in future (9). New technologies, such as extracorporeal membrane oxygenation (ECMO) and new type of high frequency jet ventilation, are now available in China and can effectively improve the hypoxemia in hemodynamically unstable patients. Interventional pulmonologists can now replace RB to FB with the support of these new technologies for some indications recommended only for RB formerly, especially in a rescue-situation under a non-specialized bronchoscopy circumstances (10,11). Therefore, it is imperative to develop standardized training programs and evaluation systems of bronchoscopy for Chinese pulmonologists. In describing the RB, Chan-Yeung provide a useful and detailed review in the development history of bronchoscope.

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### Footnote

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