

Obstruction after Self-expanding Metallic Stents in Tuberculous Bronchial Stenosis

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Expandable metallic stents seemed to be a good method in tuberculous bronchial stenosis that does not respond to medical therapy. But there was no long-term follow-up study after stents insertion in tuberculous bronchial stenosis. We report a case of obstruction after successful Gianturco metallic stents insertion due to tuberculous bronchial stenosis.

Key Words : *Stent, Obstruction*

INTRODUCTION

Large airway obstruction may be due to intraluminal disease, stenosis, tracheobronchial collapse and extrinsic compression. Surgical resection and anastomosis is the accepted approach to short focal airway disease. In many cases this may not be feasible because of the site and extent of the stenosis, the cause of the underlying disease and the general state of the patient.

Nonsurgical palliative methods have been developed and include laser photocoagulation, balloon dilatation, cryotherapy, alcohol injection therapy and prosthesis. However, these methods require expensive instruments and experienced personne. So, another palliative treatment method, self-expandable metallic stent, was used in the narrowed airway where surgical resection is inadvisable¹. This procedure had been also performed successfully in tuberculous bronchial stenosis that does not respond to medical therapy².

After insertion of stents in the large airway, previous reported short-term complications are granuloma formation, stent migration, localized inflammation, fatal massive hemoptysis, wall perforation and respiratory distress³⁻⁵. To our best knowlege, there was no report about long-term complication after stent insertion in tuberculous

bronchial stenosis.

CASE REPORT

A 29-year-old woman had had left pleuritic chest pain and dyspnea for 6 months. Eight years earlier, she had taken antituberculous medication for pulmonary tuberculosis.

Three years earlier, bronchoscopic examination revealed focal narrowing of the left main bronchus with severe fibrotic changes suggestive of sequelae of endobronchial tuberculosis. She was treated with balloon dilatation. But her symptoms increased over the next 2 months, and it was believed that further treatment was needed for her stenosis.

Therefore, she was successfully treated with Gianturco self-expandable metallic stents. After the procedure, her clinical symptoms were improved. However, 30 months after stent placement, dyspnea on exertion developed and we noted obstruction at the site of the metallic stent by bronchoscopic examination.

On physical examination, respiratory sound was absent on the side of the chest.

Chest X-ray showed total collapse of the left lung (Fig. 2B). Bronchoscopic examination revealed total obstruction of left main bronchus with granuloma-appeared polypoid mass and proximal portion of migrated metallic stents (Fig. 3). Pulmonary function tests showed the forced expiratory volume in 1s (FEV₁) of 0.74L (26% of predicted), FEV₁/FVC 50%, the forced vital capacity (FVC) for 1.48L (41% of predicted).

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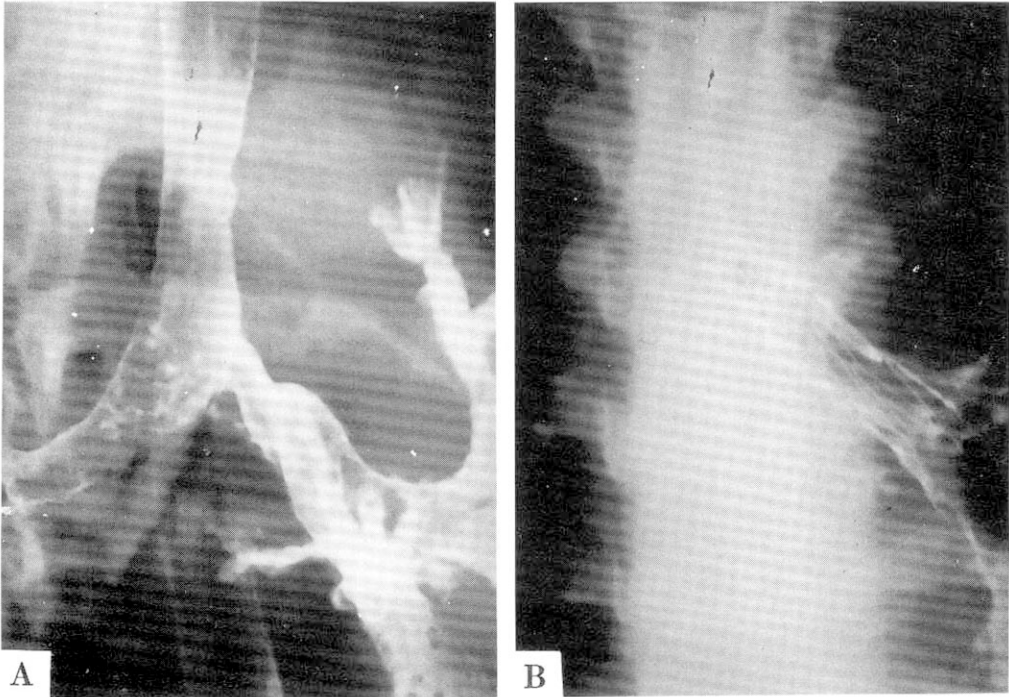


Fig. 1. Bronchogram obtained before(a) and just after (b) placement of an endobronchial stents in proximal left main stem bronchus. Bronchogram shows restoration of adequate caliber of the left main stem bronchus after stent insertion.

Resection of the left lung, including the stenotic segments of the left bronchus, was performed.

After operation, her pulmonary function tests shows FEV₁ of 1.32L (48% of predicted), FEV₁/FVC 68%, FVC for 1.80L (50% of predicted). In resected specimen, soft-palpated mass was detected with metallic stent in obstructed bronchus. Biopsy finding of left main bronchus shows granulomatous inflammation by foreign body reaction which is composed of epithelioid cells and lymphocyte.

At 6 months after the operation, the patient was clinically well.

DISCUSSION

Techniques used to treat bronchial stenosis include surgical resection, cryotherapy, laser photo-resection and balloon dilatation. However, these methods have some limitations in their expensive instruments and experienced personnel.

Cohen et al used balloon dilatation in treatment of tracheobronchial stenosis in 1984⁹.

Balloon dilatation to treat tuberculous bronchial stenosis was first reported in English literature by Nakamura et al⁷. Balloon dilatation is easier to perform, less invasive and less costly than surgery, but complications such as restenosis, bleeding, airway rupture and acquired bronchomalacia frequently occur. Another palliative method is insertion of rigid silicone T tube (Montgomery) but this type of prosthesis is poorly tolerated historically. The other palliative method, self-expandible prosthesis, has introduced in the narrowed airway where surgical resection is inadvisable¹¹.

After the first use of Gianturco self-expanding metallic stents in the vascular and biliary systems⁸, an expandable stainless steel stent was formulated for use in bronchogenic tumor, postoperative stenosis, tracheomalacia and airway collapse following tracheal reconstruction, relapsing chondritis and stenosis in secondary lung transplantation^{1, 2, 5, 9}.

The stent can restore the patency of the airway promptly and supports the airway against increased thoracic pressure during expiration,

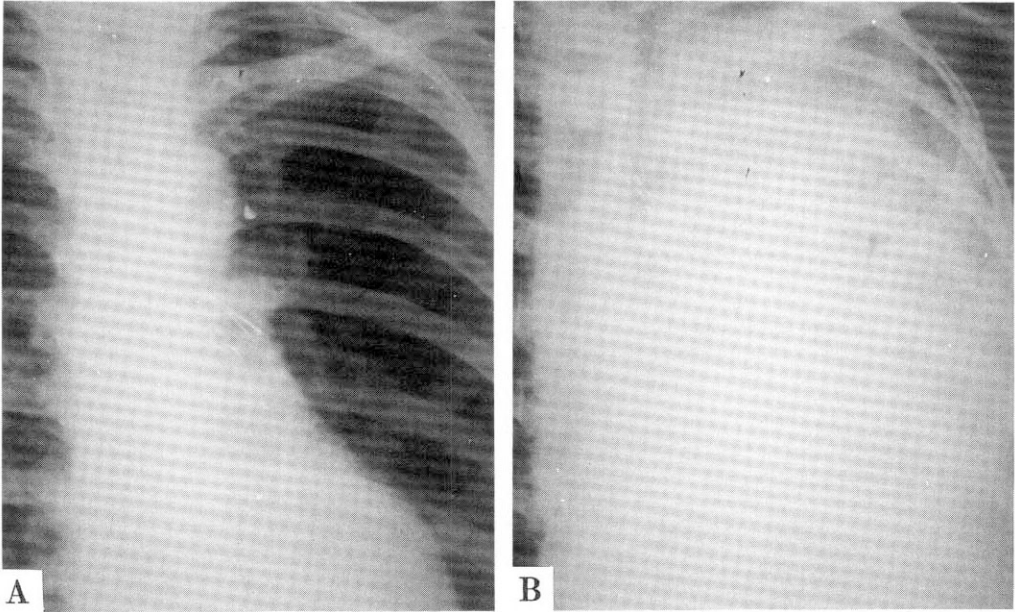


Fig. 2. Plain chest films obtained just legone (a) and 30 months (b) after placement of an endobronchial stents. Chest P-A shows total collapse of the left lung and two stents placed in the left bronchus.



Fig. 3. Bronchoscopy shows total obstruction of the left main bronchus and the the proximal portion of migrated stent override the opening of the right main bronchus.

In one physiologic study, FVC increased from 64% predicted to 73% predicted, FEV₁ from 49% predicted to 72% predicted, and the ratio of the

FEV₁/FVC from 59% predicted to 78% predicted after tracheobronchial stents insertion¹⁰.

The advantage of the self-expanding metallic stent is that it can be used with the patient under local anesthesia, it is easy to perform and does not occlude tributaries of the airway, even if the stents override the opening of the branches of the airways²¹.

The disadvantage of the stens is that it cannot be removed endoscopically. The complications are granuloma formation, stent migration, localized inflammation, dysphagia, suction catheter entrapment, fatal massive hemoptysis, rupture of the metallic mesh, obstruction, wall perforation and respiratory distress^{3,4,8,11}. The most frequently recovered isolates in granulation tissue were *Streptococci viridans*, *Pseudomonas aeruginosa*, nonhemolytic *Streptococcus*, *Staphylococcus aureus*¹².

In tuberculous bronchial stenosis, expandable metallic stent is used if restenosis occurs after several attempts with balloon dilatation. The first case of successful tuesday treatment with Gianturco self-expanding metallic stents in tuberculous bronchial stenosis was described by Song et al⁸. But there were no available longer follow-up studies.

We had successfully treated one patient with

tuberculous bronchial stenosis with a Gianturco-type stent. That patient had been asymptomatic for 30 months. The dyspnea on exertion was developed and we notified the obstruction at the site of the metallic stent by bronchoscopic examination. So, resection of the left lung was performed.

The self-expanding metallic stent was introduced as a good method in tuberculous bronchial stenosis^{2,9)}. However, expandible metallic stent does not seem to be safe in the treatment of endobronchial tuberculosis in the long-term effect.

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