Endoscopic Bronchial Polypectomy by High-frequency Electric Surgery

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Although polypectomy by high frequency electric surgery through the use of endoscopy has been widely applied to polypoid lesions in digestive canals, there have been very few reports of the treatment of bronchial lesions with this procedure. Recently, we have been successful in performing polypectomy without any complications using high-frequency electric surgery through a flexible bronchoscope in a patient with a benign bronchial polyp. Bronchial polypectomy by electric surgery has the advantages of preventing bleeding and providing large specimens for histological examination, compared with conventional methods, i.e. for forceps or laser methods.

Key words: Bronchial polypectomy, High frequency electric surgery, Inflammatory polyp

Endoscopic biopsy excision of bronchial lesions has been used successfully for over 65 years. Jackson described the removal of benign and malignant tracheobronchial tumors using a rigid bronchoscope with endoscopic punch forceps and snares (1). Recently, flexible bronchoscopy is widely used because of its safety and usefulness, and endoscopic surgery with Nd-YAG photoablation is performed to remove bronchial tumors (2). On the other hand, endoscopic polypectomy using snares and the application of high-frequency electric current has been adopted in the digestive canal because of its ease and safety (3). In addition, this procedure has the advantages of making available whole tissues for histological examination to identify malignancies. Although benign bronchial polypoid lesions are very rare, it is important to make a definitive diagnosis by histological examination because of the clinical and bronchoscopical resemblance to bronchogenic carcinoma. Thus, polypectomy by electric surgery through bronchoscopy is suitable for the treatment of bronchial polypoid lesions because of its ease and safety. Generally, open thoracotomy and lobectomy have been performed, when a bronchial polyp is found by bronchoscopy (4-6) and diagnosis cannot be obtained by routine methods, i.e. brushing and biopsy. We have successfully performed polypectomy with a flexible bronchoscope and snare, by application of high-frequency electric current in a patient with bronchial polypoid lesion. Whole specimens obtained by polypectomy were histologically examined by serial sections which revealed a benign bronchial polyp.

METHOD

A gastro-intestinal fiberscope (GIF TYPE XP, Olympus, Tokyo) with an external diameter of 7.9 mm and a system to prevent short circuiting from the snare to the operator through the bronchoscope was used for the electric surgery. High-frequency electric current was generated with a pulse generator (Olympus PSD-10, 500kHz, 30W) and a semicircular snare (Olympus SD-7p) was used to cut the polyp. The fiberscope was inserted via the mouth without...
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intubation after premedication with pentazosine (15mg), atropine sulfate (0.5mg). Topical anesthesia was effected with sprayed lidocaine (4%).

CASE REPORT

A 66-year-old man with a history of chronic bronchitis (7), visited our hospital because of hemosputum after he had caught cold. A chest roentgenogram showed a left perihilar infiltrative shadow without definite atelectasis. Sputum examination revealed negative cytology and laboratory examination showed a red-dish polypoid tumor in the orifice of the left lower lobe bronchus (Fig. 1). Left lower segmental bronchi were not seen because the orifice of the left lower bronchus was almost completely occupied by the polyp. Routine procedures, cytology by brushing and washing and biopsy by punch forceps, were performed under bronchoscopic observation and repeated three times, but all failed to reveal any malignancy. Because of a macroscopic appearance similar to that of bronchogenic carcinoma, it was necessary to rule out malignancy by histological examination of a larger specimen of the polypoid lesion and also to remove the obstructive mass preventing atelectasis of the left lower lobes and massive hemoptysis. For this purpose, polypectomy by high-frequency electric surgery was chosen since this method is non-invasive and eliminates bleeding and perforation during the operation. The top of the polyp was pulled out by the grasping forceps and the snare was inserted over the top of the polyp, as deeply as possible, and tightened before electrical cutting. A high frequency electric current was then passed through the snare for about 1 second to cut the polyp. It was impossible to remove the polypoid lesion completely at one trial as can be done in the stomach, because it was difficult to identify the base and neck by bronchoscopy. As the lumen of the bronchus is not wide as in the stomach, the bronchial lumen might have

Fig. 1. Bronchoscopic picture of left main bronchus. The orifice of lower bronchus completely obstructed by a polypoid mass which is pulled out with biopsy forceps. Only the orifice of the upper lobe bronchus (arrow) is observed.

Fig. 2. Macroscopic appearance of the biggest specimen obtained during the polypectomy by endoscopic high-frequency electric surgery.

Fig. 3. Light microscopic picture of the apical portion of the specimen as shown in Fig. 4. The polyp is covered by a normal epithelial layer and consists of connective and glandular tissues. In addition some cartilage is seen in the basal portion, Elastica-Goldner stain. Bar = 2mm.
been wholly occupied by the head of the polyp, as the polyp grew. The second operation was performed two weeks after the first operation in order to remove as much of the residual lesion as possible. Histological examination of serial sections of specimens obtained during both operations showed a benign inflammatory polyp with cartilage and no malignancy. Macroscopic and light-microscopic photograph of the biggest specimen obtained on the first operation are shown in Figs. 2 and 3, respectively. The final shape of the orifice of the left lower segmental bronchus is shown in Fig. 4. The polyp, which had occupied the left lower lobe bronchus, disappeared and the head of the polyp was buried in the left B₆, so that left B₈,₁₀ were easily observed. Examination by bronchography after the second operation showed good development of the left lower bronchus at that time except for B₆. There was no atelectasis of the left B₆ on chest roentgenogram.

DISCUSSION

An inflammatory polyp is rarely encountered. However its recognition is clinically important because it could present potentially life-threatening complications in the form of suffocation and hemorrhage (4, 6). Definitive diagnosis of this disease depends on histological findings from a biopsy specimen because the gross characteristics of the polyp are so similar to those of bronchial adenoma, papilloma and bronchogenic carcinoma. Recently, in digestive diseases, polypectomy without bleeding has been realized using the flexible endoscope and the application of high-frequency electric current permitting simultaneous cutting and coagulation (3). It is also possible that bronchoscopy can serve not only in diagnosis but as the therapeutic procedure of choice for polypectomy. However, polypectomies performed with the rigid bronchoscope requiring repeated excision with forceps or mechanical removal by snares are painful to the patient and present the risk of massive bleeding and perforation of the bronchial wall (1, 8, 9). Recently, Hopper et al (10) have applied endobronchial electrocautery in the management of obstructing endobronchial disease using a colonoscope. In the present case, we have showed that flexible bronchoscopic polypectomy can be performed safely, without bleeding, by application of a high-frequency electric current, and that specimens of sufficient size for histological study can be obtained.

Several improvements in this system are needed. For electric surgery we used a gastro-intestinal scope with a system preventing short circuiting between snare and operator. In use, the distal end of the bronchoscope should be covered by rubber and a grounded system should be provided to prevent short circuiting. Furthermore, to obtain large specimens, it is necessary that when the top of the polyp is pulled up by the grasping forceps, the snare be inserted as deeply as possible. For this purpose, a bronchoscope with two channels, one for snare and one for grasping forceps is recommended. The method reported here may be useful not only for bronchial inflammatory polyp, papilloma and adenoma but also for bronchogenic carcinoma of a polypoid shape. Compared to photoresection, this technique is economical, convenient and safe as its use is widespread in the treatment of digestive canal diseases.

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REFERENCES

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