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Case Report

A Critical Complication After Surgery for Ankylosing Spinal Hyperostosis

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Abstract We experienced a case who received a bone resection for ankylosing spinal hyperostosis through the anterior approach. He subsequently became asphyxic and suffered a cardiopulmonary arrest owing to a postoperative hematoma. His complaint before the surgery was sticking of his throat and dyspnea that continued for 3 years. X-ray films revealed an osteophyte on the anterior side of the C3-C6 vertebral bodies, and we made an anterior approach under general anesthesia. There were no problems during the surgery. After being returned to the ward without intubation, he complained that he had a catch in his throat that progressed little by little, and subsequently suffered a cardiopulmonary arrest at 5 hours after surgery. Upon revival, he had brain hypoxia. He passed away owing to malnutrition and pneumonia at 4 years after the surgery. To prevent this complication, it is important to have an understanding of this condition. We should have alerted the nurses that such a complication may occur after anterior spinal surgery. It is also important to be aware that intubation of such a case becomes difficult once the trachea has become compressed and curved because of a hematoma.

Keyword : ankylosing spinal hyperostosis, hematoma, cervical anterior approach

Introduction

Anterior approaches to cervical spine fusion are performed for many conditions, and postoperative swallowing difficulties are commonly encountered in up to 60% of such patients[1)]. Postoperative hematoma and compression of the trachea and esophagus are some of the severe complications of the anterior cervical approach. However, severe complications such as asphyxia leading to cardiac arrest are rare. Sagi et al.[1)] carried out a retrospective chart review of 311 anterior cervical procedures and found that 19 patients (6.1%) had an airway complication and 6 patients (1.9%) required reintubation. We experienced a rare case who received anterior spinal surgery, and subsequently died.

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Case Report

A 51-year-old man was referred for surgical treatment of ankylosing spinal hyperostosis (ASH) in March 2001. The patient had no medical history or bleeding tendency and did not take any internal medicines such as anticoagulants. He complained of sticking in his throat and dyspnea that had appeared 3 years previously. He suffered dyspnea continuously, but his respiratory problem before the surgery was not very severe. X-ray films revealed an osteophyte on the anterior side of the C3-C6 vertebral bodies (Fig. 1). On April 13, 2001, we removed the osteophyte from the anterior side of the C3-C6 vertebral bodies via an anterior approach. We applied bone wax to the site, performed sufficient

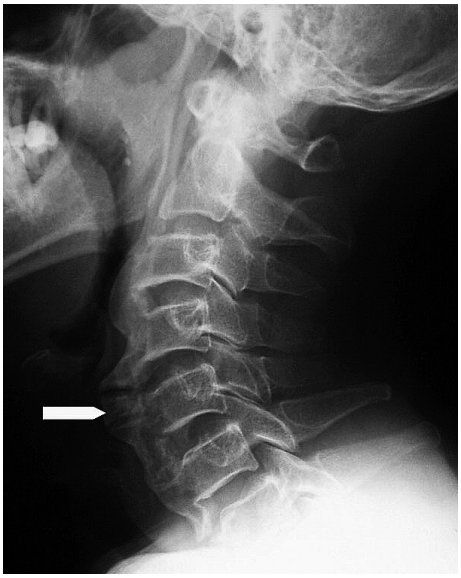

Fig. 1 Radiograph of the lateral view before surgery. A large osteophyte is detected on the anterior side of the C3–C6 vertebral bodies (arrow).

Fig. 2 Radiograph of the lateral view just after the surgery. The osteophyte has been removed and the anterior side of the vertebral bodies is smooth. The retropharyngeal space is slightly enlarged.

hemostasis and finished the surgery by retaining a suction drain in front of the vertebral bodies (Fig. 2). There was no bleeding from arteries such as the superior thyroid artery during the surgery, and there was sufficient suction from the drain after the surgery. The operation time was 107 minutes, and the total drainage was about 100 ml. We finished the surgery at 11 : 30, and he was returned to his ward at 13 : 00 with his neck fixed by a sandbag. He told us that he felt great without any sticking of his throat, and there was no change when we saw him at 14 : 00. However, he felt strange in his throat and had much saliva and sputum at 14 : 20. The nurse did not notice the swelling on his neck because it was masked by a large piece of gauze and the nurse had insufficient understanding of the possible complications after operations to the anterior cervical spine. She also did not report his condition to other staff. Two hours later, he suffered a cardiopulmonary arrest and there was no light reflex. An anesthetist tried intubation on the spot but found that it was impossible, although the entrance to the trachea could be seen. The symptoms were different from a laryngeal spasm. Since it was likely that his trachea was compressed and curved with a hematoma, we removed his suture, removed the hematoma by hand and intubated the patient. We carried out cardiopulmonary resuscitation and moved the patient to the ICU. Despite hypothermic therapy, he became acromyotonic, had difficulties maintaining a sitting position, rolling over and talking, and lost his vision. He gradually became able to breathe and eat by himself with rehabilitation, but did not have sufficient mastication. In addition, he could only speak a few words. At 4 years after the surgery, he passed away owing to malnutrition and pneumonia.

Discussion

ASH often occurs in men aged above 50 years, and involves sclerosis or ossification of the anterior longitudinal ligament on the anterior side or lateral side of the spinal body, especially from the lower part of the thoracic vertebrae to the lumbar vertebrae. Since the ligament sclerosis affects not only the ligaments of the spinal body but also the ligaments of the whole body as well as the ligament attachment areas, Resnick et al.[2] named ASH as diffuse idiopathic skeletal hyperostosis (DISH). Sclerosis can be found in areas of

the pelvis, such as the hip joint, greater trochanter, lesser trochanter, iliac crest and ischial tuberosity. Surgical treatment is performed for patients who have pain or neurological manifestations caused by hyperostosis. In our patient, we resected the ossification back to the normal vertebral bodies.

Although postoperative difficulty in breathing and a sore throat after an anterior surgical approach to the cervical spine are not rare, severe conditions such as dyspnea are very rare. Sagi et al.[1] reported that there is a risk of airway obstruction after an operation for more than three cervical vertebral bodies, blood loss of more than 300 ml, exposure involving C2, C3 or C4, and an operation time of more than 5 hours. On the other hand, a history of myelopathy, spinal cord injury or pulmonary problems, smoking, anesthetic risk factors and the absence of a drain are not correlated with an airway complication. In our case, we had the risk of exposing more than three vertebral bodies, which included C3 and C4, and our patient therefore had a high risk of airway obstruction. When he complained that he had much saliva and sputum, we should have thought that these were the first symptoms of airway obstruction because of a hematoma and observed the swelling of his neck by removing the gauze. Owing to the large piece of gauze and insufficient understanding of the possible complications, the nurse in charge of the patient overlooked the swelling of his neck. If the nurse had noticed the abnormality and told other staff a little earlier, the subsequent events and outcome might have been different. It is important to enlighten staff about the possible complications after surgery for the anterior cervical spine. Although we could see the entrance of the trachea, it was difficult to intubate the patient after the formation of the large hematoma because the trachea was severely compressed and curved by the hematoma. We opened the wound and removed the hematoma to intubate the patient. Obstruction of the trachea may occur after an anterior cervical operation and we should also realize that intubation of such cases is difficult because the trachea is curved and compressed by a large hematoma.

Conclusions

We experienced a case who had an airway complication because of a postoperative hematoma after an anterior surgical approach for ASH. It was difficult to intubate the patient because his trachea was compressed and curved by the hematoma. To prevent such a severe complication, it is essential that all staff, including nurses, are aware of the possible complications after surgery of the anterior cervical spine.

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（和文抄録）

術後に致死的合併症を生じた強直性脊椎骨増殖症の１例

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頸椎前方アプローチの術後合併症として術後血腫およびそれによる気管，食道の圧迫が挙げられるが，窒息まで至る症例は非常に希である．今回，我々は強直性脊椎骨増殖症に対して前方アプローチにて骨棘切除術を施行した後に，術後血腫で窒息し，心肺停止をきたした症例を経験した．症例は 51 歳の男性．主訴は３年前からの喉のつかえ，息苦しさであった．単純 X 線で C3-6 前方に骨増殖性の骨棘を認め，手術は全麻下に前方アプローチで侵入した．術中トラブルなく，抜管後に病棟へ帰室したが，徐々に咽頭部違和感を自覚し，術後約５時間で心肺停止になった．蘇生後，低酸素脳症による症状が持続したが，術後４年経過後に栄養不良と肺炎で永眠した．問題点として，術後の頸部の腫脹がガーゼで確認しにくかった点や，看護師への前方アプローチでの危険性の啓蒙が不十分であったこと，などが挙げられる．また，一旦血腫による窒息を生じると，気管は圧迫弯曲するため，挿管は極めてしにくくなり，先に血腫を掻き出さなければならない場合があることは注意を要する．頸椎前方固定術後，合併症の危険性を改めて認識すべきである．