

A Case of Traumatic Thoracic Outlet Syndrome

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Thoracic outlet syndrome (TOS) due to thoracic trauma is a rare disorder. Surgical treatment of TOS is especially rare. We report here a case of traumatic TOS caused by right 1st rib and clavicular fracture after a traffic accident. The patient underwent first rib resection and open reduction with fixation of the clavicle through axillary and supraclavicular incisions.

Key words: 1. Thoracic outlet syndrome
2. Trauma

CASE REPORT

A 74-year-old woman who had no health problems other than diabetes mellitus was admitted due to right chest wall pain and right shoulder pain after a traffic accident. Upon arrival at the emergency room, fractures of the right clavicle and first rib were observed by chest computed tomography (CT) (Fig. 1). Edema and a tingling sensation of the right upper extremity were progressively worsening. Subclavian vein compression by the fractured clavicle and rib were identified by three-dimensional CT angiography leading us to suspect thoracic outlet syndrome (TOS) (Fig. 2). Preoperative electromyography (EMG) was not performed since the patient did not complain of motor weakness, and the main problem of the patient was venous compression. With these symptoms and results, traumatic TOS was diagnosed and surgical treatment was planned. An operation was performed under general anesthesia. The first rib was partially removed, leaving the posterior stump through the axillary incision. The fractured clavicle and other ribs were aligned manually and fixed with plates and screws through the supraclavicular and thor-

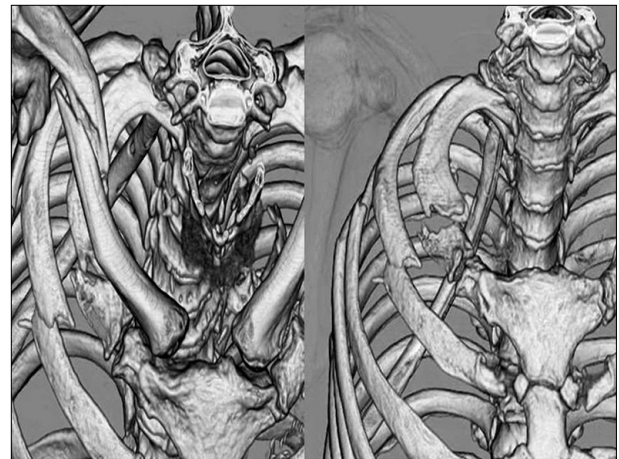


Fig. 1. Chest computed tomography with 3-dimensional reconstruction shows right clavicular and multiple rib fractures involving 1st rib.

acotomy incision, respectively. Venous engorgement had disappeared on postoperative three-dimensional CT angiography (Fig. 3). The patient was discharged without complications and had no complaint of edema or a tingling sensation of the right upper extremity as of the last follow-up.

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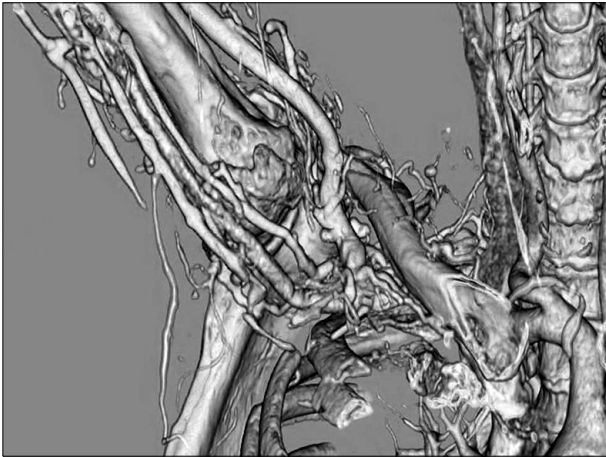


Fig. 2. Chest computed tomography with 3-dimensional reconstruction shows venous engorgement due to compression of fractured 1st rib and clavicle.

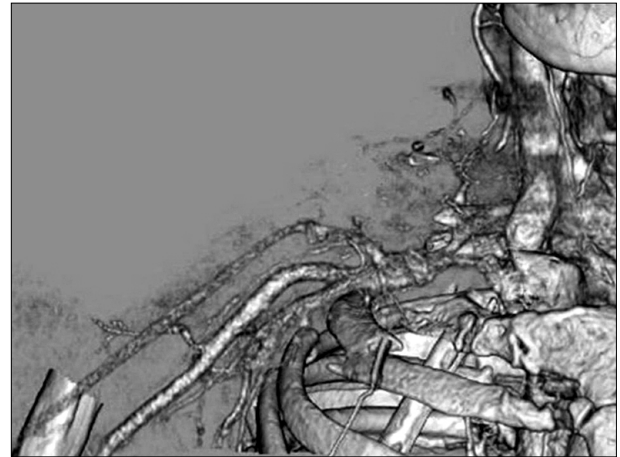


Fig. 3. Follow-up chest computed tomography with 3-dimensional reconstruction shows no venous compression or engorgement on right upper extremity.

DISCUSSION

Thoracic outlet syndrome is defined as the compression of the neurovascular structures around the superior aperture in the chest. Most cases are caused by compression of the cervical ribs, the first rib, or the scalenius, by a fractured clavicle, or by a tumor of the thoracic outlet [1]. TOS can be classified into three types: neurogenic, venous, and arterial TOS. Various symptoms occur due to compressed structures. Surgical treatment of TOS is rare in Korea because of its low incidence rate. The diagnosis of TOS can be performed by only patients' subjective symptoms due to a lack of objective diagnostic methods [2]. In particular, traumatic TOS treated by surgical methods is extremely rare around the world. This case will be the first case of surgically treated traumatic TOS in Korea. The surgical treatment of TOS has been controversial, although neurovascular compression identified by clinical symptoms, radiological tests, angiography, and EMG is an indication for surgical treatment. However, others believe that physical therapy is a sufficient treatment in most cases [3-5]. Despite the controversy of this issue, surgical treatment has been performed for traumatic TOS caused by severe neurovascular compression. Surgical methods vary from traditional methods like a posterior approach and axillary incision to an updated method like rib resection by a supraclavicular incision [1,6]. The posterior approach is a meth-

od in which an incision is made in the muscle between the scapula and vertebra and the ribs are removed. The disadvantage of this technique is the excessive muscle incision. The axillary incision technique is the method in which an incision is made between the latissimus dorsi and pectoralis muscle below the hairline in the axilla and a rib is removed. Complete resection is impossible by axillary incision; however, it is the most common method [7]. The supraclavicular incision technique is an appropriate method for all three types of TOS. In particular, the advantage in cases of arterial TOS is that arterial reconstruction is possible, although the controversy over the complete resection of the first rib remains [8]. Large-scale studies on the indications of surgical treatment for TOS and the appropriate surgical technique are needed.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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