POSTTRAUMATIC DISRUPTION OF THE RIGHT MAIN BRONCHUS – A CASE REPORT

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Summary

Introduction. Tracheobronchial disruption is a rare disorder, usually accompanied by a severe blunt chest trauma that quite rarely appears as an isolated event. Case Report. This is a case report of a right main bronchus disruption, due to an injury to the right hemithorax, caused by a falling tree trunk. The disruption was accompanied by mediastinal emphysema, fractures of the 4th and 5th ribs on the right side and compound sternal fracture. The patient was operated in general anesthesia, through right thoracotomy approach, followed by successful right main bronchus reconstruction by interrupted suture technique, without anatomical resection of the lung parenchyma. Conclusion. Although this injury is rare, with suspicion of bronchial rupture, bronchoscopy confirms the diagnosis and leads to better prognosis.

Key words: Bronchi; Thoracic Injuries; Wounds and Injuries; Bronchoscopy; Pneumothorax; Thoracic Surgical Procedures; Chest Tubes; Treatment Outcome

Introduction

The incidence of tracheobronchial disruptions due to blunt trauma of the chest is very low, accounting for 1 – 2.8% of all injuries. Most patients with this type of blunt injury, up to 80%, do not survive transportation to the hospital [1–3]. The accurate diagnosis fails to be established in almost 68% of the cases. A high clinical suspicion index and adequate interpretation of radiological findings are crucial for the diagnoses of these injuries, enabling an urgent surgical intervention with a primary suture of the airways. The proper treatment reduces the risk of death, as well as partial or total bronchial stenosis [2–4].

Case Report

A 44-year-old male patient was transferred from a regional hospital with right chest injuries induced by a falling tree trunk a day prior to admission. On admission, the patient was tachypneic, spontaneously breathing, his oxygen saturation was 82% with a breathing mask applied, anxious, hemodynamically stable, with a chest tube placed in the right hemithorax and persistent air leak through the applied drain. The chest drain

Figure 1. Chest X-ray on admission

Slika 1. Rendgenski snimak grudnog koša prilikom prijema

a chest tube placed in the right hemithorax and persistent air leak through the applied drain. The chest drain

Sažetak

Uvod. Traheobronhijalna disrupcija predstavlja redak poremećaj i obično je povezana sa ozbiljnim, tupim traumama grudnog koša, dok se izuzetno retko javlja izolovano. Prikaz slučaja. Ovo je prikaz slučaja disrupcije desnog glavnog bronha koji je nastao prilikom pada stabla u predelu desnog hemitoraksa. Disrupcija desnog glavnog bronha je bila praćena mediastinalnim emfizemom, prelomom IV i V rebra sa desne strane i dvostrukim prelomom sternuma. Pacijent je operisan u opštoj anesteziji u predelu desnog hemitoraksa. U delu disrupcije izuzetno retko jednom bronhoskopiji, doveoće nas do željene dijagnoze, a samim tim i bolje prognoze.

Ključne reči: bronhi; povrede grudnog koša; rane i povrede; bronhoskopija; pneumotoraks; grudna hirurgija; torakalni dren; ishod lečenja
tube was placed in the intensive care unit of the regional hospital. Radiologically, the drain was properly positioned, but the right pneumothorax persisted (Figure 1). Detailed medical history revealed that the patient had a long history of alcohol abuse. The chest X-ray on admission showed a 4th rib fracture and a pneumothorax on the right. The chest computed tomography showed a total pneumothorax on the right side, a mediastinal shift, as well as a 5th rib fracture and a compound fracture of the sternum. Since a right main bronchus rupture was suspected, a bronchoscopy was performed, revealing a disruption of the right main bronchus. Following a short-course preoperative management, the patient underwent right exploratory thoracotomy in general anesthesia. Complete rupture of right main bronchus was found 1.5 – 2 cm distally to the carina (Figure 2). Considering that the time from the injury was 24 hours, primary repair with debridement was performed by interrupted sutures and two chest tubes were placed. The postoperative course was without complications; there was no air leakage, fallen lung sign or pneumothorax (Figure 3). On the 3rd and 4th postoperative days the chest tubes were removed. Control chest X-ray revealed no signs of either pneumothorax or emphysema. On the 5th postoperative day, the patient was discharged for home treatment.

Discussion

The first case of tracheobronchial tree traumatic rupture was reported by Webb in 1848, following the autopsy of a male patient who had been run over by a car [5]. First successfully primary surgical treatment of the tracheobronchial rupture was performed by Scannell in 1951 [6]. It is believed that the mechanism of injury includes a combination of anteroposterior chest compression, causing stress on the carina, while the lungs still remain in contact with the lateral chest wall, and a rapid elevation of the intraluminal pressure due to the glottis closure reflex [3, 6]. Over 80% of these injuries develop 2 cm from the tracheal carina and most of them have been registered in young patients with a relatively elastic chest wall [3, 6, 7].

There are two clinical presentations documented, depending on the peribronchial tissue status (intact/non intact). A large rupture will induce a total pneumothorax, inducing dyspnea impossible to resolve, a condition which may further go bad if a chest tube is introduced. In this case, the diagnosis is clear, usually requiring an emergency intervention [1, 3]. If peribronchial tissues are intact, the manifested symptoms may be very mild, such as minimal pneumothorax and minimal air leak in the mediastinum. This condition is difficult to recognize on a standard chest X-ray [8]. These situations require a high clinical suspicion index, especially in young patients when the mechanism of injury suggests a rupture of the airways. If an injury of the airways is suspected, bronchoscopy should be performed. However, these procedures should be carried out in the operating room in total anesthesia, due to the risk of disruption of the peribronchial tissue, so that an endobronchial tube can be introduced distally beside the disruption, or a two-lumen tube may be introduced in case a disruption is not visualized [7, 10].

Conclusion

Once the diagnosis of bronchial disruption is established, surgical treatment offers the best long-term prognosis; open surgery with debridement and end to end anastomosis if it is possible. There are cases when lung resection is needed. Recently, there are attempts to perform this procedure via uniportal video assisted thoracic surgery approach.
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