Trauma and reconstruction

Pneumoscrotum in patient with pneumothorax: A case report

Rama Firmanto, Fina Widia, Gampo Alam Irdam

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ABSTRACT

Pneumoscrotum is a rare clinical condition that might be a secondary of another serious, life-threatening condition. In pneumoscrotum, the scrotum enlarged due to the presence of air in the scrotal sac, either in the subcutaneous tissue or tunica vaginalis. We report a 40-year-old male presented to the emergency room, with a shortness of breath. From the examination, the patient was diagnosed with left pneumothorax and performed Water Sealed Drainage (WSD) on the left hemithorax. After the installation of WSD, pneumoscrotum was obtained and conservative treatment was performed in the patient to treat the pneumoscrotum.

Introducation

Pneumoscrotum is a clinical condition that rarely discussed by urologists because of its rareness. In this condition, the scrotum enlarges due to the presence of air in the scrotum pouch, either in subcutaneous or in tunica vaginalis (pneumatocele). The presence of air in the scrotum can be caused by several etiologies, of which are life-threatening conditions, such as Fournier's gangrene and pneumothorax. This case report will discuss pneumoscrotum in patients with pneumothorax.

Case presentation

A 40-year-old man presented to the emergency room at Cipto Mangunkusumo Hospital Jakarta, due to shortness of breath which has been burdensome for two days before hospital admission. The patient complained of chest pain, which improved if the patient's position is tilted to the right. There is a history of tuberculosis (TB) on therapy with anti-tuberculosis drugs (rifampicin, isoniazid, pyrazinamide, ethambutol, and streptomycin) for two months before hospital admission.

On laboratory, leukocytosis and respiratory acidosis were found. Chest radiograph shows the presence of left pneumothorax, with no signs of infiltrates in both lungs.

The patient was diagnosed with a left pneumothorax and was treated with an installation of a water sealed-drainage (WSD) in the left hemithorax. The patient's condition showed improvement. The Heimlich valve was installed as a patient's preparation for outpatient care. After the procedures, the patient got another left pneumothorax, with extensive subcutaneous emphysema. The WSD was re-installed to improve the patient's condition (Fig. 1).

After re-installation of the WSD, pneumoscrotum was found in the patient (Fig. 2). Conservative treatment was carried out to overcome the situation. After 5 days of treatment, the pneumoscrotum can be treated (Fig. 3).

Pneumoscrotum is a very rare clinical condition. In this condition, the scrotum was swollen because there is air in the scrotal sac, either in the subcutaneous tissue or the tunica vaginalis, and it usually painless. One of the literature states that 39 out of 59 cases (66%) were caused by iatrogenic conditions or trauma, 17 out of 59 cases (29%) occurred spontaneously, and three cases (5%) are unknown. Regarding the incidence, 13 cases (32%) were caused by complications of gastrointestinal endoscopic procedures, 6 cases (15%) occurred due to laparotomy, and 13% were caused by blunt chest trauma.
Furthermore, 4 cases (10%) occurred due to chest drainage; whereas those caused by thoracic surgery, laparoscopy, and ventilation aids or jet vents were found to be around three cases in each action (8%). There is only one pneumoscrotum (3%) reported due to percutaneous liver biopsy and one case due to heart-lung resuscitation.

The incidence of pneumoscrotum that occurs spontaneously is most commonly found in gastrointestinal perforation conditions, 8 cases (46%). A total of three pneumoscrotum (18%) occur in tension pneumothorax; 2 (12%) in necrotizing enterocolitis; and 6% for each reported one case of Fournier gangrene, perinephric abscess, intestinal atresia, and necrotizing fasciitis.

The pneumoscrotum can occur through several mechanisms; intra-thoracic, intra-abdominal, and accumulated air or gas originating from the scrotum. The air from intra-thoracic into the scrotum bag can occur in patients with a pneumothorax or pneumomediastinum. In pneumothorax patients, air from the lung enters through the Camper's and Scarpa's fascia. Whereas in the pneumomediastinum, the air coming from the mediastinum enters the perinephric cavity through the diaphragm hiatus, causing the pneumoretroperitoneum which then followed by moving air into the scrotum through the spermatic fascia and the inguinal canal. In patients with pneumoperitoneum, air can penetrate the abdominal wall (by diffusion or through a peritoneal defect) which then accumulates in the scrotum. In some cases, air can move into the scrotum through patent processes vaginalis.

The third mechanism, the pneumoscrotum can occur due to the presence of air or gas in the scrotum, it can originate from infection (Fournier gangrene) or due to trauma to the scrotum.

Therapy for the pneumoscrotum can be either conservative or invasive. In conditions caused by pneumoperitoneum, the etiology must be determined and the appropriate action taken accordingly. Therapy for treating pneumothorax is based on the size and patient condition, WSD was installed in patients with deteriorating condition.
Although the pneumoscrotum is not a life-threatening condition, with the discovery of the mechanism and causes of the pneumoscrotum, appropriate therapy can be determined. In this case report, the main cause of the pneumoscrotum is the patient's pathological condition, pneumothorax with the mechanism for the presence of air in the scrotum via intra-thoracic. The installation of WSD is the first step that can choose to treat the patient followed by conservative therapy in the management of the pneumoscrotum itself.

**Conclusion**

Pneumoscrotum is a condition that is rarely found but cannot be ignored, because it can be a secondary condition from another serious condition that can be life-threatening. The main cause of the pneumoscrotum must be found so that appropriate treatment can be determined. Conservative management is an option in most patients with a pneumoscrotum. The limitations of the published literature are the drawbacks of this case report. This is because there are not many case reports about the pneumoscrotum that can be found, especially regarding the pneumoscrotum caused by a pneumothorax.

**Consent**

The patient has already given his consent to be reported and published as a case report.

**Conflict of interest**

There is no conflict of interest, neither financial nor nonfinancial, in the whole process from making to publishing this study.

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