CASE REPORT

Descending mediastinitis secondary to deep neck abscess in a healthy patient: Case report

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ABSTRACT

Necrotizing descending mediastinitis is an emergency which can be fatal in most cases. 80% to 85% of patients who develop descending necrotizing mediastinitis are young, previously healthy persons. We present the case of a healthy patient who, after a neck abscess, developed descending necrotizing mediastinitis complicated by atypical interstitial pneumonia.

KEYWORDS: mediastinitis, lung diseases, interstitial, case report.

INTRODUCTION

Descending necrotizing mediastinitis (DNM) is a rare but potentially fatal disease and 80% to 85% of patients who develop DNM are young, previously healthy persons[1]. Studies have shown that morbidities such as diabetes mellitus, heart, lung, liver diseases, alcoholism and chronic renal failure can be attributed to the extension of the infection process to the mediastinal space[2].

The cervical and thoracic anatomy is closely related to the risk of DNM from deep neck abscesses (DNA)[2]. The retropharyngeal, vascular and pretracheal spaces are highly vulnerable to the spread of infection. The downward spread of DNA is always accelerated by gravity, respiration and negative intrathoracic pressure in the mediastinum and pleural cavities[3].

The anatomy of the cervical layers is essential for understanding the route the infection can take from the neck to the mediastinum. The deep cervical fascia is divided into three layers:

- Superficial: It encompasses all the deep structures of the neck, inserting into the nuchal line and continuing anteriorly to divide the trapezius, sternocleidomastoid and infrahyoid muscles.
- Middle or pretracheal: involving the esophagus, trachea, pharynx, larynx, thyroid and parathyroid glands.
- Deep or prevertebral: originates from the nuchal ligament and contains the spinal column and spinal muscles. This fascia is divided into two layers, an anterior alar and a posteriorly prevertebral[4].

From the neck to the mediastinum, there are three potential routes of spread: the pretracheal route to the anterior mediastinum, the lateral route through the parapharyngeal to the middle mediastinum, and the retropharyngeal route to the posterior mediastinum[5].

Estrera et al. defined the criteria for the diagnosis of DNM, which include the following: 1) clinical evidence of severe oropharyngeal infection, 2) characteristic imaging findings of mediastinitis, 3) documentation of DNM during surgery,

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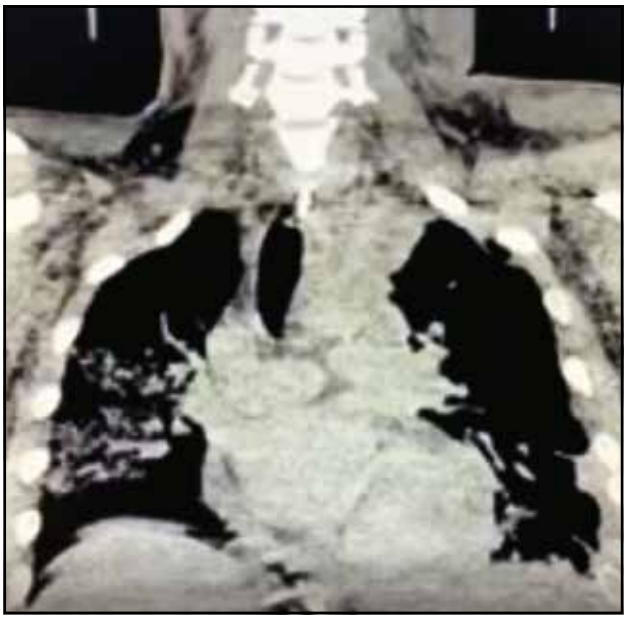

Figure 1. Neck and thorax CT scan: trachea displaced to the right, purulent fluid occupying the visceral space, both at the parapharyngeal, submandibular, submental, retropharyngeal and left paratracheal levels.

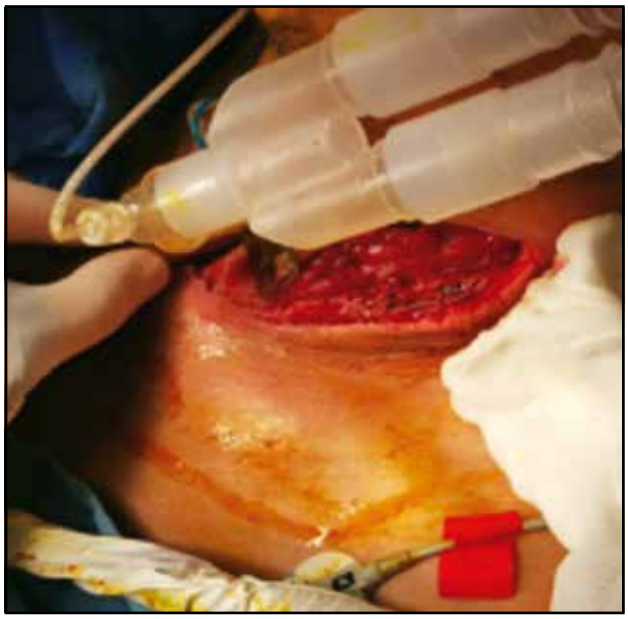

Figure 2. Purulent collection at the infraclavicular level in the left hemithorax that drained approximately 15 cc, involving only soft tissues in an 8x5 cm area, previous wounds with abundant purulent material and scarce fibrin.

post-mortem or both, and 4) establishing the direct link between oropharyngeal infection and the development of necrotizing mediastinitis[1].

Many authors have verified the importance of computed tomography (CT) as the mainstay for the early diagnosis of DNM, since it is a precise and specific tool to direct surgical drainage and monitor postoperative progression. Contrast CT scan is considered to be the gold standard in the diagnosis and evaluation of DNA and DNM[3].

CASE REPORT

A 30-year-old male patient with a history of allergy to penicillin and sulfa, without other significant comorbidities, presented symptoms after the extraction of the lower right first and second molars, and later presented with an increase in volume in the right submandibular region and local erythema, which was treated with Erythromycin, without improvement. The patient presented purulent material leakage through the surgical site, with subsequent increase in size in the submental and contralateral submandibular region, with local erythema that extended to the anterior chest, as well as a fever of 38°C and relevant dyspnea. Treatment with Levofloxacin and Clindamycin was started by the Otorhinolaryngology department.

The first contrast neck and thorax CT scan showed an increase in volume and hydro-air levels at the submental, submandibular, bilateral carotid, parapharyngeal and retropharyngeal levels, extending towards the superior mediastinum (Figure 1); a tracheostomy and DNA drainage were performed, where 150 cc of pus was drained, and an orocervical fistula of the oral cavity was observed at the level of extracted teeth.

24 hours after surgical drainage, the patient had an increase in volume at the left infra- and supraclavicular level, with the presence of pain on palpation and fluctuation, accompanied by pain on deep inspiration in the left hemithorax, feverish peaks and mild respiratory distress. A new CT scan was performed, that showed the larynx and trachea displaced to the right, without airway compression, with hydro-air levels and a heterogeneous image at the level of the sublingual, submental, submandibular, bilateral parapharyngeal, carotid and visceral spaces on the left and paratracheal in the upper side of the mediastinum, as well as a left pleural effusion of approximately 60%.

A new exploration and surgical lavage of the neck, replacement of the tracheostomy tube, left thoracotomy and placement of an endopleural tube were performed (Figure 2).

Abundant purulent material continued to escape through surgical wounds and the endopleural catheter, as well as feverish peaks and general deterioration. A new CT scan of the neck and thorax, without and with enhanced contrast, was requested, in which air-fluid levels and a heterogeneous image at the neck and mediastinum level were observed, for which it was decided to intervene urgently

Figure 3. VAC system on the neck.

Figure 4. Collections in the left neck, ipsilateral sternocleidomastoid muscle with intramuscular gas collections, collection in the anterior mediastinum and residual collection in the left pleural cavity (neck and thorax CT scan, coronal slice).

again with a re-exploration of the left thoracotomy with drainage and toilet. An abundant fetid fluid was found in the pleural cavity, a loculated anterior collection, a posterior and a left basal collection, an anterior abscessed tract that dissected between the pericardium and the parietal pleura in the direction of the aortic arch towards the emergence of the second and third supra-aortic trunk, which yielded 600cc of intrathoracic pus. At the cervical level, pus was found occupying the prevertebral, parapharyngeal, pharyngomucosal, submaxillary and bilateral visceral spaces predominantly on the left, the latter in contact with the carotid sheath, and the sternocleidomastoid muscle had multiple intramuscular collections. A vacuum-assisted closure system (VAC) was placed on the neck (Figure 3).

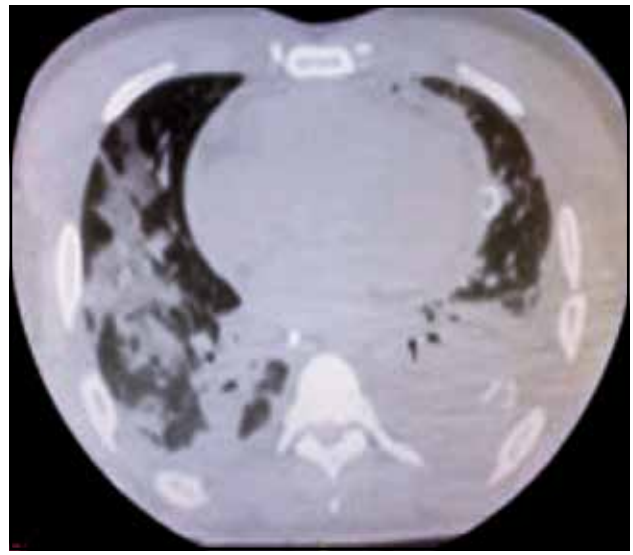

Figure 5. Chest angio-tomography image: bilateral ground-glass pulmonary infiltrates with left pleural effusion, compatible with viral pneumonia.

On the ninth day of admission, a new imaging study was performed (Figure 4).

The patient was admitted to the operating room for re-exploration with debridement and placement of the VAC system, and was sent to the intermediate therapy service, with a change in the antibiotic scheme to Piperacillin-Tazobactam, Linezolid and Clindamycin. With failed attempts at ventilatory weaning, he presented feverish peaks and high ventilatory requirements.

On the 20th day of hospital stay, a chest angiotomography was performed (Figure 5) due to the suspicion of pulmonary thromboembolism, without finding any data on it.

The patient presented an unfavourable evolution, with an increase in ventilatory requirements, and eventually died on the 26th day of hospital stay.

DISCUSSIONS

Descending necrotizing mediastinitis is defined as a mediastinal infection secondary to the spread of oropharyngeal infections through the cervical fascia[6]. It is a life-threatening disease, relatively rare but with rapid progression, which is why most

patients must be admitted to the Intensive Care Unit (ICU)[7].

The most common sources of deep neck abscesses are pharyngeal and odontogenic infections, which are also the most common source of DNM. A considerable number of patients with DNA and DNM undergo more than one surgical procedure for repeated drainage and debridement[6].

Our case was approached in a timely manner, performing the necessary procedures, both securing the airway, as well as the cervical and thoracic drains to improve prognosis.

CONCLUSIONS

The literature addressing cases of DNM after neck abscess in healthy patients is limited. It is well known that DNM has a high fatality rate; however, patients without comorbidities may have a better prognosis. In our case, it occurred in a young patient without comorbidities, in a poor environment that worsened the prognosis.

Contribution of authors: All authors have equally contributed to this work.

Conflict of interest: The authors have no conflict of interest.

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