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Case Report

Surgical management of non-traumatic hypopharyngeal perforation with descending mediastinitis

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Abstract

Perforation of the hypopharynx is an extremely rare condition of various etiologies. In even rarer cases, it can lead to mediastinitis, a serious complication with a high mortality rate of up to 35%. We present a case of a 52-year-old male patient with a purulent descending mediastinitis caused by a rare condition of rupture of the hypopharynx after the ingestion of solid food. Mediastinal gas and fluid as well as pleural empyema were observed on CT scan. The case is unique because of the cervical surgical approach used to treat it, as well as a number of techniques that appear to control the infection and treat the source of mediastinitis. The patient recovered completely 20 days postoperatively and was followed up clinically and by computed tomography without persistent symptoms or late complications.

Keywords

hypopharyngeal perforation, mediastinitis, mediastinoscopy

Introduction

In the majority of cases, hypopharyngeal perforation is reported as a rare complication of non-penetrating neck trauma, which is primarily associated with road traffic accidents. Low-velocity impacts can also be the cause of this injury, but in these cases the mechanism of occurrence consists of hyperextension of the cervical spine.[1] Other causative mechanisms of hypopharyngeal perforation described in the literature include iatrogenic post-interventional traumas, such as endotracheal intubation, esophagogastroscopy, transesophageal echocardiography, and foreign body swallowing.[2,3] Mediastinitis, on the other hand, is more common in emergency thoracic surgery. It is associated with a high mortality rate and is an extremely difficult complication to manage. The mortality rate in purulent mediastinitis can reach up to 35%, and the time from the onset of symptoms to the establishment of a diagnosis and commencement of surgical treatment is of fundamental importance for the outcome of the disease.[4]

Case report

This case involves a 52-year-old man who was admitted to the emergency room because of severe subcutaneous emphysema that had been getting worse over the course of five days. This had happened after the patient had eaten a dinner that included solid food. He reported that he felt abruptly a sharp pain in the throat area and that the discomfort and radiation spread to the neck, becoming more intense when swallowing. The patient was previously treated for peritonsillar abscess 1 month ago. After the spreading of the subcutaneous emphysema and inability to take food and liquids due to choking and aspiration after every attempt of oral intake, the patient was admitted to the hospital. Computed tomography of the neck

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and chest with intravenous and oral contrast was performed ***(Fig. 1)****. Evidence of right pleural empyema was found on CT scan as well.*

Following the administration of water-soluble contrast media via the oral route, X-ray series were conducted, which revealed the presence of extraluminal contrast in the oropharynx, trachea, esophagus, and respiratory tract. However, no evidence of fistula was observed ***(Fig. 2)****.*

The patient was prepared and transferred to the operating theatre for emergency surgical intervention. An awake intubation with a bronchoscope was performed, due to the described suspicion of a tracheoesophageal fistula. A massive rupture of the right hypopharyngeal wall was found, without affecting the trachea ***(Fig. 3)****.*

The surgical team made the decision to perform a transverse cervical incision. The pretracheal fascia was opened and a large purulent collection was evacuated from the right paratracheal and paraesophageal space. The parapharyngeal purulent collections were opened and drained and a right paratracheal collection was drained using videomediastinoscopy. Following the drainage of the abscesses, a VATS was performed on the right chest cavity, at which point pleural empyema was discovered. This was treated by means of saline irrigation and aspiration of the pathological contents, after which a chest drain was placed. The patient remained on mechanical ventilation for 3 days, after which he was

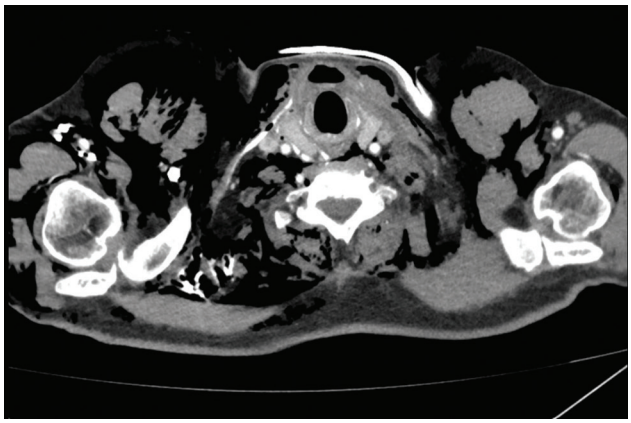

Figure 1. Massive subcutaneous emphysema due to perforation.

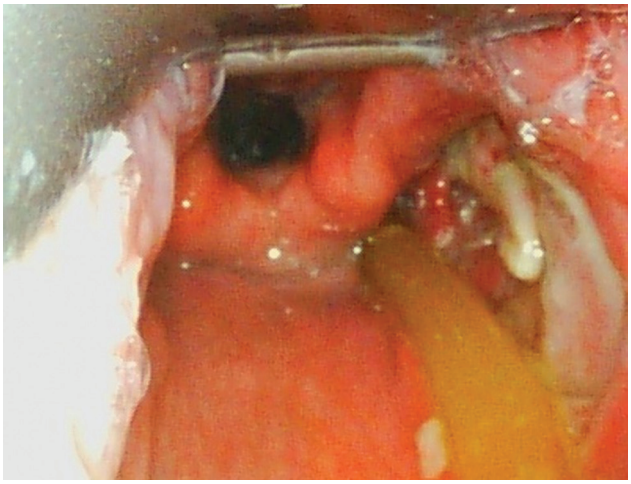

Figure 3. Rupture of right lateral wall of the hypopharynx.

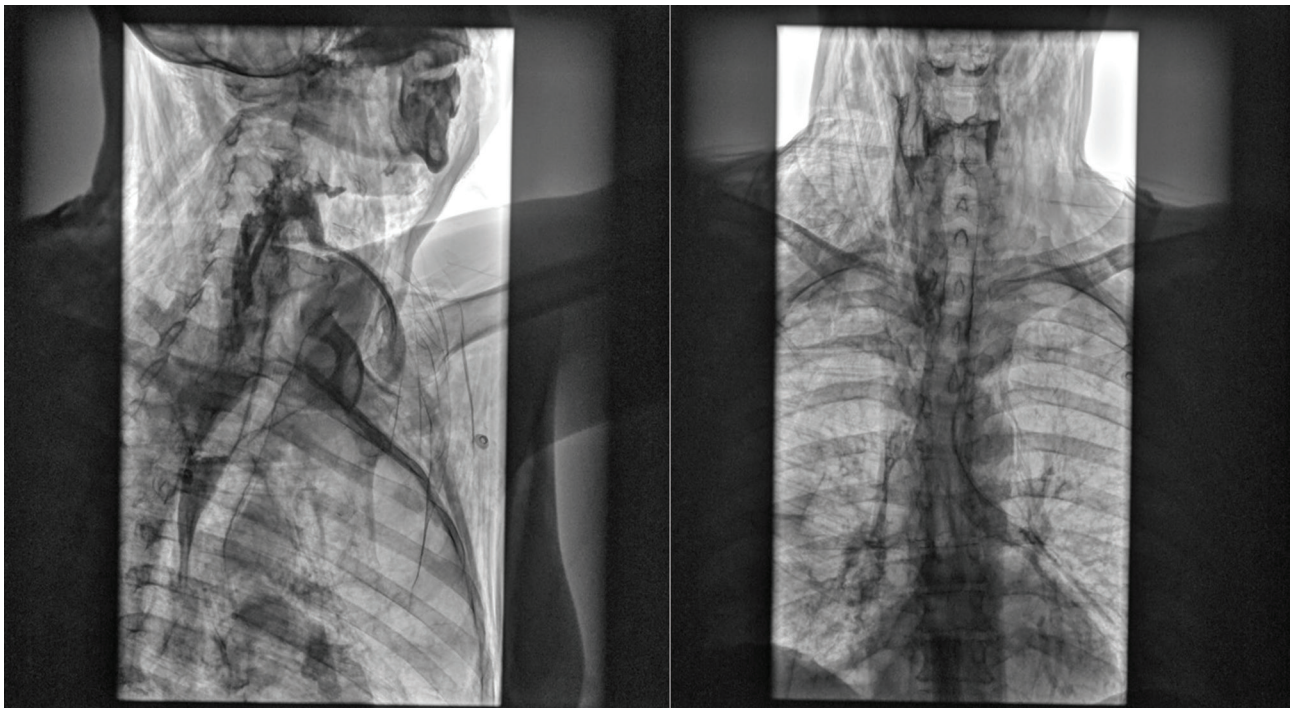

Figure 2. A, **B**. Perforation of the hypopharynx, transitioning into the proximal esophagus, and extralumination of contrast in the area with its spillage into the paraesophageal mediastinum.

extubated, remained on parenteral nutrition and after five days he was fed through a nasogastric tube. Seven days postoperatively, oral fluid intake was started. A hypopharyngeal fistula was formed, with a course opening through the surgical wound. This closed spontaneously within 14 days of the operation. After the operation, the patient was monitored for six months, during which time no pathological findings from computed tomography or clinical symptoms associated with the disease were discovered.

Discussion

The most common cause of hypopharyngeal perforation is iatrogenic injury. It has a more favorable prognosis than perforation in closed neck trauma, where the tear is usually significantly longer and extends into the proximal esophagus.[5] Knowing the size and localization of the perforation is essential for proper treatment of the lesion. Most authors believe that the most appropriate behavior is primary closure of the defect but there are no strictly defined guidelines for the treatment of this type of trauma and the behavior depends mainly on the experience and judgment of the surgeon.[6,7]

Hypopharyngeal perforation may be a rare complication of retropharyngeal abscess. A review of the literature found no reports similar to the present case and the incident was presented as a case report. Operative treatment is a mandatory component of complication management and contamination control.[8] Compliance with the general surgical rules for control of a septic focus as applied in this case, wide opening and drainage of the mediastinum and the interfascial neck space are sufficient as a series of interventions to completely cure the disease. Reconstructive techniques and attempts to close the perforation are not necessary at all cost.[9,10]

Mediastinoscopy is an interventional procedure used primarily for diagnosing and stage the mediastinum in lung carcinoma.[11] The use of videomediastinoscopy for therapeutic purposes is rarely described and only in specific cases, but its use as a method for treating paratracheal and paraesophageal purulent collections is novel, and no similar applications of this procedure were discovered when reviewing the literature.[12] The formation of a fistula between the perforation opening and the incisional opening of the neck is a self-limiting phenomenon and spontaneous closure is observed in parallel with prolonged antibiotic therapy and does not require restriction of enteral nutrition.[13]

Conclusion

Perforation of the hypopharynx is an uncommon occurrence, accompanied by severe complications, including mediastinitis, phlegmon of the neck, and sepsis. A high level of clinical suspicion is imperative for timely diagnosis and treatment. Its occurrence can be of different etiology mainly related to trauma, ingestion of foreign bodies and iatrogenic interventions, but other rare causes such as complicated peritonsillar abscess can also be observed. The condition is occasionally challenging to diagnose, and its timely detection and prompt surgical intervention are of paramount importance for those affected.

References

1. Smith D, Woolley S. Hypopharyngeal perforation following minor trauma: a case report and literature review. Emerg Med J 2006; 23(1):e7.
2. Wolff A, Kuhn F, Ogura H. Pharyngeal-esophageal perforations associated with rapid oral endotracheal intubation. Ann Otol Rhinol Laryngol 1972; 81:258–61.
3. Alsalamah RK, Alaraifi AK, Alsalem AA, et al. Hypopharyngeal perforation following foreign body ingestion: a case report. Cureus 2021; 13(11):e19708.
4. Sugio K, Okamoto T, Maniwa Y, et al. Descending necrotizing mediastinitis and the proposal of a new classification. JTCVS Open 2021; 8:633–47.
5. Michel L, Grillo HC, Malt RA. Operative and nonoperative management of esophageal perforations. Ann Surg 1981; 194:57–63.
6. Brinster CJ, Singhal S, Lee L, et al. Evolving options in the management of esophageal perforation. Ann Thorac Surg 2004; 77:1475–83.
7. Bourhis T, Mortuaire G, Rysman B, et al. Assessment and treatment of hypopharyngeal and cervical esophagus injury: Literature review. Eur Ann Otorhinolaryngol Head Neck Dis 2020; 137(6):489–92.
8. Keszler P, Buzna E. Surgical and conservative management of esophageal perforation. Chest 1981; 80:158–62.
9. Shockley WW, Tate JL, Stucker FJ. Management of perforations of the hypopharynx and cervical esophagus. Laryngoscope 1985; 95:939–41.
10. Abboud NM, Dziubek M, Bogaert S, et al. A surgical alternative in the treatment of hypopharyngeal perforation. Plast Reconstr Surg Glob Open 2022; 10(1):e4029.
11. Gelberg J, Grondin S, Tremblay A. Mediastinal staging for lung cancer. Can Respir J 2014; 21(3):159–61.
12. Bulut T, Brutel de la Rivière A. Mediastinoscopy as a therapeutic tool. Ann Thorac Surg 2011; 91(5):1616–8.
13. Sun L, Song YM, Liu LM, et al. Causes, treatment and prevention of esophageal fistulas in anterior cervical spine surgery. Orthop Surg 2012; 4(4):241–6.