

Massive Pharyngeal Perforation after Tire Explosion Barotrauma

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ABSTRACT

Objectives: 1) Recognize the clinical presentation of pharyngeal tears; and 2) discuss medical and surgical management of large pharyngeal tears.

Study Design: Case report.

Methods: Patient chart analysis and literature review.

Results: 26 year old male with hemoptysis, odynophagia, neck pain, and hoarseness after a truck tire exploded while being filled with air. Nasopharyngolaryngoscopy showed a right pharyngeal laceration with active bleeding. Computed tomography of the neck and Gastrografin swallow study showed a large perforation of the right pharyngeal wall with air dissecting through the deep neck to the superior mediastinum. The patient was taken to the operating room for repair of pharyngeal perforation, exploration of the neck, and placement of a neck drain. The drain was removed after 3 days, and the pharyngeal perforation was fully healed after 2 weeks without any complications.

Conclusions: Barotrauma is capable of causing significant damage to the pharynx, and thorough evaluation is necessary in severe cases to determine if surgical repair is indicated.

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INTRODUCTION

Pharyngeal perforations caused by barotrauma are rare injuries in head and neck trauma. Few cases have been reported in the literature, with most injuries being relatively small and ultimately treated conservatively. We present a unique case of a massive pharyngeal perforation caused by barotrauma from a truck tire explosion and resulting surgical intervention.

CASE REPORT

A 26 year-old male presented after the rear 10 ply tire of a dually pickup truck exploded while he was filling it with air. He complained of hemoptysis, odynophagia, and hoarseness without any significant external injuries. On physical exam, he was found to have blood in his oropharynx and right neck crepitus. A flexible nasopharyngolaryngoscopy was done at the bedside revealing a laceration of the right pharyngeal wall with slow bleeding. A chest radiograph showed subcutaneous air over the right lower neck extending into the right superior mediastinum without pneumothorax. A computed tomography (CT) of the neck exhibited a large laceration of the right posterior pharyngeal wall with air dissecting through the soft tissue of the deep and superficial right neck (Fig. 1). A gastrografin swallow study was also obtained, which was positive for contrast extravasation within the right lower lateral neck extending down to the superior right mediastinum (Fig. 2).

The patient was then taken to the operating room for microdirect laryngoscopy, bronchoscopy, and esophagoscopy. A gaping 6 cm laceration was found exposing underlying pharyngeal muscle. It extended from posterior to the midlevel right tonsillar pillar and inferiorly to the right esophageal inlet. The laceration was repaired primarily with chromic sutures. Due to the extensive free air, a decision was made to proceed with a right neck exploration. A small external cervical incision was made, dissection was taken up to the carotid sheath and a penrose drain was placed. At the end of the case, a nasogastric tube was placed under direct visualization. The patient was kept NPO and started on IV antibiotics. The penrose was removed on post-op day 3. He was discharged home with strict NPO diet and nasogastric tube in place for tube feeds and a 1 week course of antibiotics.

A repeat gastrografin study was done on post-op day 12, which showed a small focal outpouching in the area of the previous leak. He then started a soft diet and was seen in clinic post-op day 18, where flexible nasopharyngolaryngoscopy showed the right pharyngeal laceration to be well healed, and the nasogastric tube was removed. A soft diet was recommended for 2 more weeks before transitioning to a regular diet.

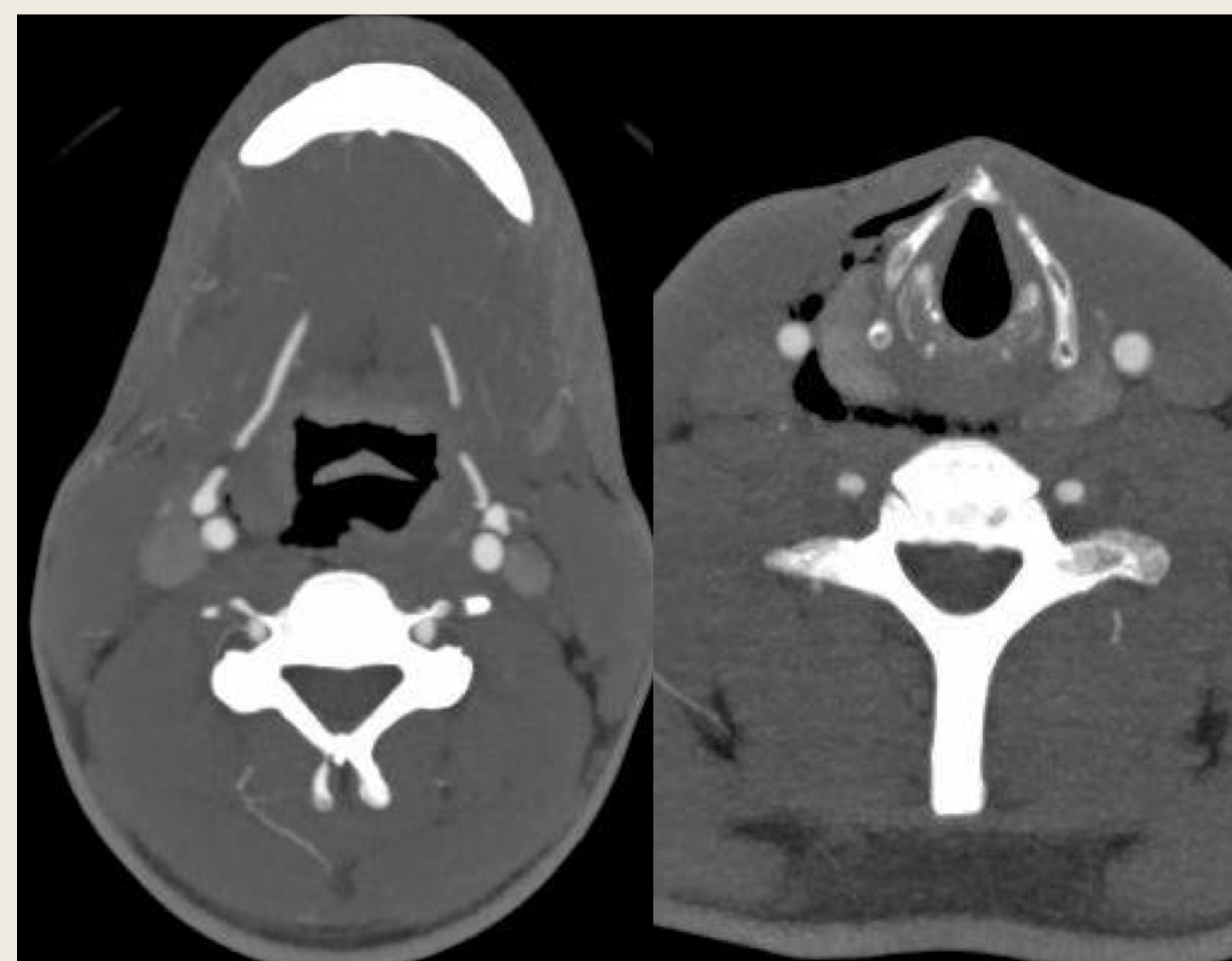


Figure 1. CT neck with contrast showing disruption of the right posterior pharyngeal wall with soft tissue air dissecting down the retropharyngeal space and extending anteriorly between the carotid sheath and thyroid cartilage



Figure 2. Gastrografin swallow study showing extravasation within the right lower lateral neck extending down to the superior right mediastinum

DISCUSSION

Mechanisms of barotrauma previously reported often involve exploding bottles or bicycle tires with only one recent report of an automobile tire related injury.⁽¹⁾ The mechanism of tissue damage is thought to be the result of a sudden increase in pressure from the compressed air within the pharynx distending the pharyngeal walls leading to perforation.⁽²⁾ Signs and symptoms of perforation commonly include hoarseness, stridor, oral bleeding, dysphagia, odynophagia, and neck crepitus.⁽³⁾ Initial work-up in an emergency setting should include chest radiograph and flexible nasopharyngolaryngoscopy. CT neck and gastrografin swallow studies are also beneficial in both identifying the location and the soft tissue extent of the perforations.

In the case presented, a CT neck had been obtained as part of the work-up by the emergency department. The decision to obtain a gastrografin swallow study was made in order to better appreciate the degree of the perforation as both CT and direct visualization resulted in limited information. The large amount of contrast extravasation indicated a large perforation, so it was felt that surgical intervention was indicated.

In the past, it was recommended that pharyngeal perforations larger than 2 cm be repaired primarily, but recent literature has shown similar outcomes with conservative management consisting of antibiotics, nasogastric tube placement, and nothing by mouth.^(4,5) While the average size of pharyngeal perforations is about 1.6cm, this case was significantly larger at 6cm.⁽³⁾ Given the size of the laceration and the extent of soft tissue dissection in this patient, surgical repair was performed to reduce the risk of infection and improve postoperative pharyngeal function.

CONCLUSIONS

Starting treatment as soon as possible is the most important factor in preventing complications from pharyngeal perforations. The decision to surgically explore the neck and repair the perforation should be determined on a case-by-case basis taking into consideration size of the perforation, extent of neck involvement, and the clinical status of the patient. This case highlights a unique presentation of massive pharyngeal perforation following tire explosion, which responded well to primary closure and drain placement.

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