



Case report

Penetrating esophageal injury: A diagnostic challenge in resource-limited settings; a case report

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ABSTRACT

Introduction: Penetrating injuries to the upper aerodigestive tract are potentially life-threatening, with significant morbidity and mortality. Although rare, the cervical esophagus is the most vulnerable part of the esophagus to penetrating injuries. Given the unique and condensed anatomy of the neck, penetrating injuries to the second zone of the neck pose a demanding challenge. Contention exists in diagnosing and managing penetrating esophageal injuries.

Case presentation: Herein is a case of a young male with a penetrating neck injury from the left lateral aspect with subsequent esophageal injury. An early primary repair with muscle buttress resulted in admirable results.

Discussion: Accurate diagnosis and timely management are critical in deflating morbidity and mortality. Flexible esophagoscopy and Computed tomography with water-soluble contrast are the ideal modalities for diagnosing penetrating neck injuries, as clinical evaluation alone can readily overlook cervical esophagus injury. The esophageal repair depends on the patient's clinical condition, the extent of damage, anatomical location, and duration of the injury. Management varies from a conservative approach to radical esophagectomies. Surgery remains a cornerstone in managing penetrating esophageal injuries. Primary repair with an external drain is advocated within 24 h of injury.

Conclusion: A high index of suspicion and timely diagnosis are critical in successfully managing penetrating esophageal injuries. Neck injuries demand a comprehensive evaluation for any aerodigestive or vascular leaks. Early primary repair with a muscle buttress improves the chance of an effective repair.

1. Introduction

Neck anatomy is peculiar as it houses high-density vital structures in a small confined area, including the major neurovascular structures, respiratory, lymph structures, and the esophagus [1]. The esophagus is the hollow muscular tube extending from the hypopharynx to the gastroesophageal junction [2]. Supplied by marginal blood vessels, the esophagus lies within the paravertebral course between major neurovascular structures of the neck. [1,2]. The esophagus lacks mesentery and a protective serosal coat [2]. A unique internal organ, as it crosses three regions, cervical, thoracic and abdominal [1,2]. Like the abdominal part, the cervical esophagus has an average length of 3–5 cm, while the thoracic region is the longest at 18–22 cm [1,3].

Classification of esophageal injury is based on the mechanism of injury (blunt or penetrating) and anatomical location, cervical (57 %),

thoracic (26 %), and abdominal (17 %) [1]. The American Association of Trauma Surgery-Organ Injury Scale (AAAST-OIS) has classified esophageal injuries into five grades [4].

Grade I Contusion/Hematoma, partial-thickness laceration.

Grade II Laceration <50 % circumference.

Grade III Laceration >50 % circumference.

Grade IV Segmental loss or devascularization <2 cm.

Grade v Segmental loss or devascularization >2 cm.

Diagnostic evaluation of the cervical esophagus includes x-rays of the neck, chest, and computed tomography with or without oral contrast [5]. Cervical x-rays of sagittal view may show air film within neck soft tissues [3]. Computed tomography (CT) using water-soluble contrast is mainly preferred, with a sensitivity of 92–100 % [5,6]. The sensitivity of the endoscopy is close to 100 %, with a specificity of 83 % [5,7]. Although endoscopy has the advantage of direct visualization, it may

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aggravate the perforation by instrumenting the wounded esophagus and expanding the transmural gap. This case report has been elaborated following SCARE 2020 criteria [8].

2. Case report

A 25-year-old male was involved in a motor traffic accident and sustained a penetrating neck wound. He had an open injury on the left side of his neck, profusely bleeding. Upon arrival at our facility, he was fully conscious with a blood pressure of 126/72 mmHg, a pulse rate of 98 beats per minute, and oxygen saturation of 97 % in room air. Plain X-rays of the chest exposing the neck revealed no aerodigestive organ damage (Fig. 1). Due to financial constraints, a neck-chest CT scan and esophagography were not done. He was then taken to the theatre for wound exploration and hemorrhage control.

Under general anesthesia, a compression pack was removed, and a penetrating wound of about 4 cm through the posterior aspect of the sternocleidomastoid was adequately exposed. Upon inspection, a cut end of the cervical esophagus was seen, with >50 % circumferential involvement and gastric contents leaking through the defect (Fig. 2). The proximal cut edge had retracted and was not easily visualized. The muscle was torn at its third central aspect with bleeding vessels branching from the thyrocervical trunk (Fig. 2). The injury had spared major neurovascular and airway structures. Both lumens were intubated using Ryle's nasogastric tube (NGT). Hemostasis and surgical debridement were attained (Fig. 2). The initial mucosal repair was done with polyglactin 3-0 interrupted sutures. Sternocleidomastoid muscle was repaired, then buttressed to the esophagus. An external drain was placed, followed by wound closure in layers.

The Post-operative was uneventful. The external drain was removed on the third day post-operative. He was kept on a nasogastric tube for feeding, a proton pump inhibitor, and a five-day course of intravenous antibiotics. A month later, during outpatient visits, he was otherwise healthy. Gastrografin esophagogram revealed a patent and well integrity of the esophagus (Fig. 3).

3. Discussion

The cervical esophagus is most prone to penetrating wounds, with a

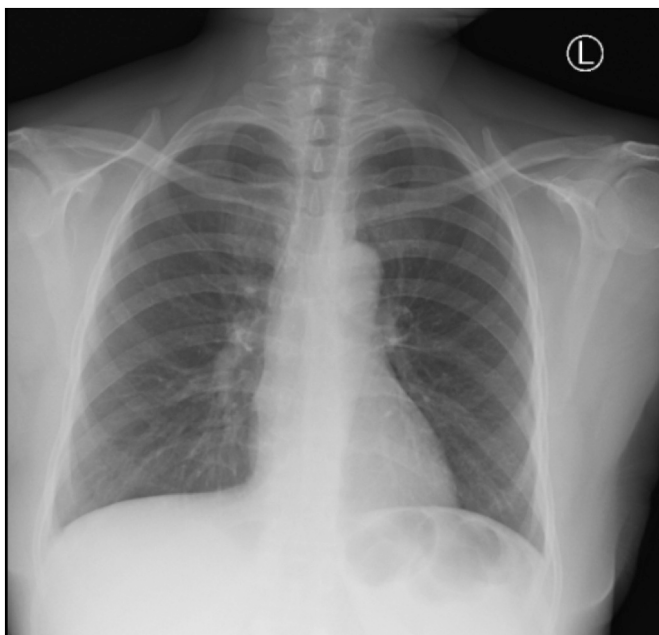


Fig. 1. Plain chest X-rays exposing the neck with no evidence of traumatic insult.

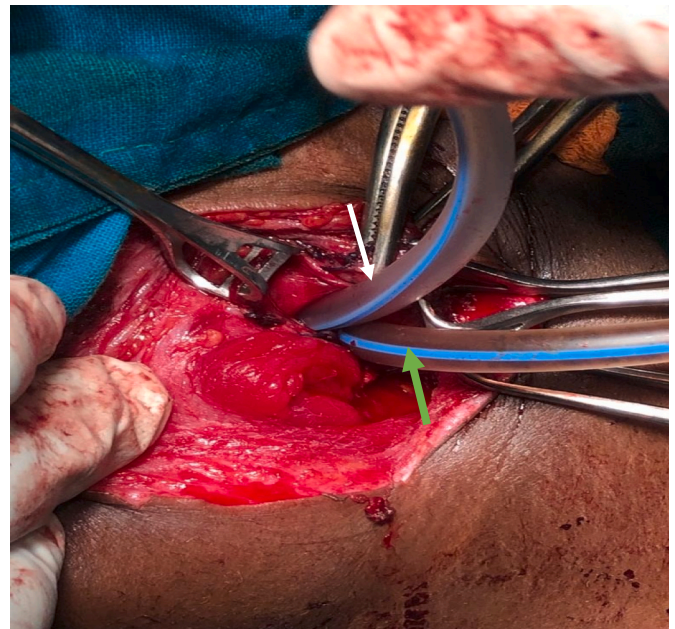


Fig. 2. Esophageal intubation using nasogastric tubes, the proximal end (white arrow) and distally (green arrow) draining gastric contents. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

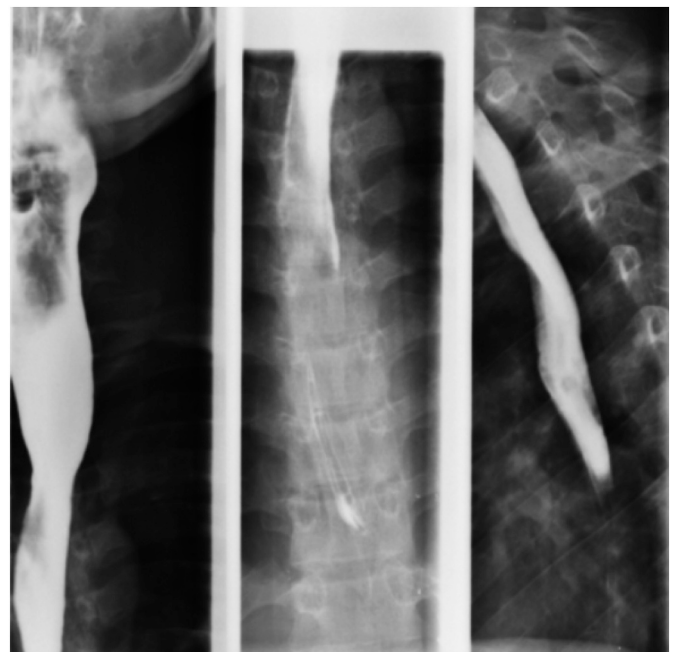


Fig. 3. Gastrografin esophagogram, showing patency and integrity of the esophagus.

mortality rate of 20 % [1,3]. Esophageal perforation is a rare and challenging clinical finding in trauma [7]. The clinical outcome depends on the injury's nature, location of the insult, delays to diagnosis, and treatment [1,9]. Esophageal injuries may present atypically; classical presentation includes sudden onset dysphagia and emphysema, often seen in cervical esophageal injuries. Other frequently reported symptoms are pain (71 %), fever (51 %), and dyspnea (24 %) [3]. Our patient presented within six hours of insult with a bleeding neck wound as the sole complaint. The esophageal injury was overlooked and missed

during the initial evaluation. He was immediately optimized and planned for wound exploration. Fortunately, the esophageal damage was noted, evaluated then repaired primarily with sternocleidomastoid muscle buttress and minimal degree of gastric contamination. A follow-up of two months revealed a patent and intact esophageal repair.

Management of cervical esophageal injury varies widely from a conservative approach to surgical drainage and primary repair [10]. The conservative approach may be considered in concealed or controlled leaks without toxic systemic symptoms [1]. Management includes coverage with broad-spectrum antibiotics, nil per oral, bypass through an NGT or gastrostomy feeding tube, and parenteral feeding [1,11]. The surgical intervention consists of a primary mucosal repair and a muscle buttress to prevent disruption of the repair and tracheoesophageal fistula [1,11]. Other complex surgical interventions which are infrequently required include esophagectomies with anastomosis or the formation of controlled fistula through a T-tube diversion or esophagostomy and Penrose drainage [12]. Treatment choice depends on the extent of injury, tissue viability, degree of contamination, and duration of the insult [10]. Generally, primary repair with a muscle buttress is advocated within 24 h of injury [11]. Delays of at least 24 h have poor predictive value [7,12]. Accurate diagnosis and timely, appropriate management are critical in reducing morbidity and mortality [1]. The complications of esophageal injury are rapid and lethal [12]. Fever and septicemia present late and are mostly related to the thoracic or abdominal esophagus presenting with mediastinitis or peritonitis [3,7].

4. Conclusion

A thorough clinical and appropriate evaluation is necessary in evaluating and managing penetrating neck injuries as the cervical esophagus is vulnerable to penetrating wounds with significant morbidity and mortality. Esophageal injuries may present in an atypical fashion. In healthy tissues, a primary repair is encouraged within the first 24 h of injury. Thorough debridement, defect closure, and draining of the contaminated sites are the mainstay of esophageal repair.

Ethical approval

Not applicable.

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Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal upon request.

Registration of research studies

Not applicable.

Guarantor

All authors in the article accepted full responsibility for the work. They had access to the patient's information and decided to publish it.

Credit authorship contribution statement

Dr. Kennedy Misso: Participated in surgery of the patient, drafted, and approved the final article.

Dr. Hashim Titho: Participated in surgery, drafted, and approved the final article.

Tendai Joylene: Perioperative care, drafted and approved the final article.

Jonathan Bonaventura: Participated in surgery, drafted and approved the final article

Kondo Chilonga: Consulted during surgery, drafted, and approved the final article.

Samuel Chugulu: Consulted perioperative, drafted, and approved the final article.

Declaration of competing interest

The authors declared no conflict of interest.

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