



Case Report

Pectoralis Major Myocutaneous Flap Reconstruction of a Traumatic Gunshot Wound to the Oropharynx: A Case Report

Kyle Mangum,¹ Jad Zeitouni,¹ Krystal Morton,¹ Daniel Nguyen, MD,² Yusuf Dundar, MD²

Abstract

Penetrating injuries to the neck can be complex and life-threatening. The main priority in these events is to stabilize the patient and address any immediate danger. For patients who survive, there is often a need for reconstruction. Complications such as fistulas may also arise, which can be resolved through reconstruction. The standard of care in most hospitals across the United States for neck reconstruction involves the use of a free flap and free tissue transfers, based on the defect and the patient's overall health status. In this case report, we present the successful closure and reconstruction of a laryngopharyngeal gunshot wound and an associated pharyngocutaneous fistula using a left pectoralis major myocutaneous flap (PMMF). This case highlights the PMMF as a safe and well-researched alternative to free flap reconstruction in select patients and demonstrates a potential niche for regional flap reconstruction in modern head and neck surgery.

Keywords: Reconstruction, Regional Flap, Trauma

Introduction

Since its introduction in 1979, the pectoralis major myocutaneous flap (PMF) has been utilized in head and neck surgery to improve outcomes, reduce complications, and facilitate single-stage reconstruction.¹ Despite the success of this regional flap, advances in microsurgery and free flap reconstruction have shifted the standard of care for head and neck reconstruction in developed countries toward free flap techniques.² While free flaps are currently considered the best choice, there remain situations where regional flaps may be appropriate alternatives. The PMF has a long history of use as a regional flap for head and neck reconstruction and has demonstrated high flap survival rates.³ In

developed countries, the PMF is primarily indicated for salvage reconstruction due to complications such as fistula formation or for primary reconstruction in patients with multiple comorbidities. It remains the first choice for head and neck reconstruction in developing countries and in regions lacking access to a microsurgery team.⁴

Penetrating neck trauma is characterized by damage to the neck that breaches the platysma muscle.⁵ Such injuries can affect various neck structures, leading to vascular

Corresponding Author:

Kyle Mangum
Texas Tech University Health Sciences Center,
Amarillo, TX
Email: kyle.mangum@ttuhsc.edu

injury in 25% of cases, aerodigestive injury in 23% to 30%, and the need for laryngotracheal or pharyngeal repair in 32.8% of cases.⁵⁻⁷ Initial management of penetrating neck trauma can be challenging, given the potential for rapid patient deterioration. Although the initial phases of management have received significant attention in the literature, there is limited coverage regarding the reconstruction of penetrating neck injuries. In this case report, we highlight the use of a PMF to close and reconstruct a gunshot wound to the neck and an associated pharyngocutaneous fistula.

Case Summary:

A 17-year-old male presented to the emergency department with a self-inflicted gunshot wound to the midline of the neck. The patient arrived via air ambulance and had his airway secured through a cricothyrotomy prior to arrival. The 6-cm entry wound was located just inferior to the chin, with no exit wound. A head CT revealed several hematomas and an interpeduncular cistern subarachnoid hemorrhage. Bullet fragments were visualized in the neck, including a fragment in the C2 transversarium wall. CT angiography showed mild irregularity of the left proximal internal carotid artery without flow limitation, as well as pooling of contrast in the soft tissue of the neck. Bilateral common carotid, cervical internal carotid, and vertebral arteries were all patent.

Upon operative exploration, significant laryngeal-tracheal damage and a 5-6 cm esophageal injury were identified, along with numerous vascular injuries to branches of the thyroid artery and the left external jugular vein (Figure 1). Due to extensive head trauma, there was increased intracranial pressure that needed resolution before surgery could proceed. On the sixth hospital day, a direct laryngoscopy and neck



Figure 1: CT reconstruction showing extensive laryngeal damage

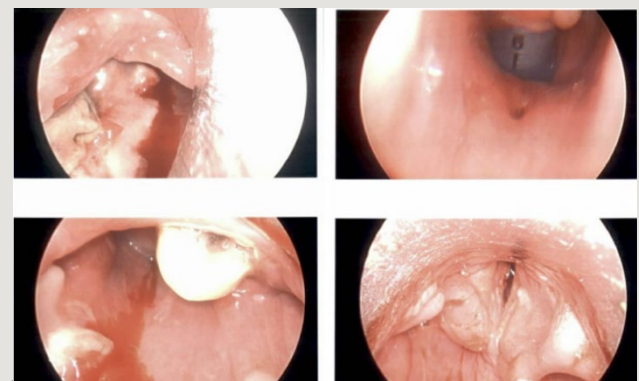


Figure 2: Laryngoscopy showing fistula, bullet fragments, and laryngeal damage

exploration were performed (Figure 2). A significant left pyriform sinus defect connected to the external open neck wound, along with partially destroyed thyroid cartilage, was noted. The external skin wound measured approximately 5 cm by 4 cm. At this time, foreign bodies were removed, and hypopharyngeal/laryngeal tissue was debrided until healthy mucosal edges were reached. On hospital day 20, a pharyngocutaneous fistula was assessed, measuring 3 cm from the left pyriform sinus to the external neck wound. Vocal cord function was evaluated through flexible scope examination. The right vocal cord was mobile; however, the left cord was paralyzed, as expected. After discussions with the family, larynx preservation was offered based on the findings from the flexible scope examination.

On hospital day 23, a pharyngoplasty and left pectoralis major myocutaneous flap (PMMF) were performed to address the wound and fistulas. Over the next 6 days, the fistula resolved, and the flap healed

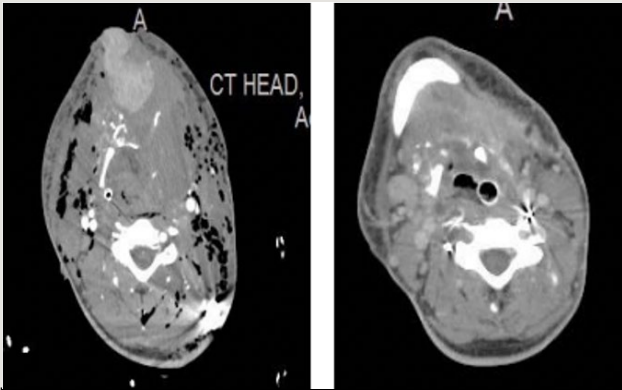


Figure 3: CT scan at admission (left) and discharge (right)

appropriately. On hospital day 29, the patient was discharged to a rehabilitation facility.

Discussion:

The role of regional flap reconstruction is still being defined in an era where free flap reconstruction has become the standard where possible. In certain cases, there is a preference for free flap reconstruction, especially when a thin, pliable flap is needed for proper shaping or when the pedicle must pass through an anatomical stricture. Free flaps are also favored when substantial reconstruction is needed in areas too distant from any regional flap or in major bone reconstruction scenarios.⁸ The only distinct indication for regional flaps is in patients lacking donor vessels. For patients with severe comorbidities, poor prognosis, or those who are medically fragile, a regional flap may be preferable due to its comparable outcomes, easier execution, shorter operative time, and often lower economic burden compared to free flap reconstruction.^{8,9} Stevens et al. discuss the treatment of blast wounds, including

considerations for reconstruction. They emphasize the importance of a deliberate approach and mention the potential use of vascularized local flaps and free flaps.¹⁰

Conclusion:

This case report highlights a patient population for which regional flaps may be considered over free flap reconstruction and explores other circumstances that may prompt a surgeon to consider a regional flap for neck reconstruction. Education on the indications, advantages, and disadvantages of each reconstruction method will enable surgeons to make the most appropriate choice for their patients until more definitive research is conducted.

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Affiliations:

¹ Texas Tech University Health Science Center, School of Medicine, Lubbock, TX, USA

² Texas Tech University Health Science Center, Department of Surgery, Lubbock, TX, USA