Acute Parapharyngeal Abscess as a Rare Complication of Adenotonsillectomy: A Case Report and Literature Review

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Abstract

Objectives: To report a previously undocumented case of a pediatric acute post-tonsillectomy parapharyngeal space abscess, and understand the possible etiologies via a literature review of similar documented cases. To review the clinical and radiologic presentation, as well as medical and surgical management, of this rare complication.

Study Design: Case report.

Methods: Case report and review of the literature.

Results: Few reports of acute post-tonsillectomy parapharyngeal space abscesses exist in adults, and none in children; those documented support injecting needle or suture needle violation through the tonsillar fossa as a potential etiology.

Conclusions: We describe here a previously unreported case of an acute parapharyngeal abscess after adenotonsillectomy in a pediatric patient. CT imaging provides the most accurate information about abscess size, location, and relationship to important neurovascular structures within the parapharyngeal space. Management of these abscesses is based on clinical presentation and radiologic findings and can range from intravenous β-lactamase inhibiting antibiotics geared towards commonly encountered bacteria, to urgent transoral surgical drainage unless contraindicated. Great care must be taken to avoid deep penetration into the parapharyngeal space via the tonsillar fossa while injecting local anesthetic or suture ligating vessels recalcitrant to electrocautery hemostasis.

Case Report

A six year old boy, with an otherwise unremarkable past medical history, presented with a two year history of chronic snoring and restless sleep. His physical examination showed 3+ tonsils and pectus excavatum. He underwent an adenotonsillectomy after a polysomnogram confirmed the presence of mild obstructive apnea. The procedure was performed using a bovie electrocautery and the operative findings included minimal adenoid tissue, but large tortuous vessels traversing the tonsillar capsules. A 4-0 chromic suture was used to ligate a bleeding vessel at the left inferior pole. The remainder of the procedure was uncomplicated; however, the child was admitted for overnight observation secondary to poor oral intake. He was discharged on post-operative day one on liquid amoxicillin. On post-operative day three, he presented to the emergency room with poor oral intake in the preceding 12 hours, headache, trismus, dysphagia, left otalgia, and left torticollis. On physical exam, he was afibrile with stable vitals signs. There was 2 cm trismus (preventing oral cavity examination) along with extreme tenderness to palpation over the edematous and erythematous region above and below the body of the left mandible and upper neck (Image 1). A CBC confirmed a WBC of 12.3 with 78% neutrophils, which had increased from the post-operative value of 5.1. A CT of the neck with contrast showed a 1.0 cm x 0.6 cm x 0.4 cm rim enhancing collection within the left parapharyngeal space causing internal jugular vein compression (Image 2). The clinical and radiographic picture was consistent with a parapharyngeal space abscess. Over concern for the jugular vein compression, headaches, and abscess, the patient was taken to the operating room for intraoral drainage of the abscess. A tract was identified at the left inferior tonsillar pole. When pressure was applied to the submandibular region, 2 cc of purulent fluid was expressed (Image 3) through this tract. Intraoperative cultures were positive for streptococcus viridans, coagulase negative staphylococcus aureus, and β-hemolytic streptococci. He was treated IV amoxicillin/sulbactam and continued this treatment regimen until discharge. Within 8 hours after surgery he was tolerating liquids and his trismus and neck pain had improved. His CBC the following day dropped to 3.8, and his admission symptoms had completely resolved. He was discharged on a ten day course of Augmentin without further complications.

Discussion

The parapharyngeal space is described anatomically as an inverted pyramid with the base at the mastoid tip extending inferiorly to the apex near the greater cornu of the hyoid. It is bounded medially and laterally by the lateral parapharyngeal wall and ramus of the mandible/deep parotid lobe, respectively. Anteriorly, it is demarcated by the medial pterygoid muscle, and posteriorly by the prevertebral fascia. The poststyloid compartment contains the internal jugular vein, carotid artery, cranial nerves IX-XII, and the sympathetic chain. Most large series of deep neck infections do not differentiate between parapharyngeal and retropharyngeal infections since both areas are frequently involved due to their thin separation by alar fascia. In one series, Nagy et al showed that 77% of infections involve both areas. The most common preceding illness was an upper respiratory infection, although up to 30% of patients had no antecedent infection. The most commonly encountered clinical features are: leukocytosis (> 15,000), fever, torticollis, adenopathy or neck mass, sore throat, and dysphagia. Interestingly, most studies that reviewed the clinical presentation of parapharyngeal abscesses identified trismus in between 19 and 36% of patients.

Computed tomography (CT) scanning is a critical part of parapharyngeal abscess evaluation. Traditionally, the lateral neck x-ray was used to evaluate deep neck infections, although it has limited utility in specifically imaging parapharyngeal abscesses and phlegmons. CT of the neck not only identifies the size and location of an abscess but also its relationship to the great vessels, heavily influencing the approach to surgical management. Sensitivity, defined as identification of a rim enhancing fluid collection on CT imaging with surgical drainage of purulent material, ranged between 81% and 100%. Specificity data is more limited since most patients with CT imaging negative for an abscess, do not proceed to surgery for ultimate confirmation; one study quoted a value of 67%. The Nagy series, as mentioned previously, showed that all 47 deep neck infections were mediastinal to the great vessels.

The medical and surgical management of parapharyngeal abscesses is highly variable and requires prudent clinical judgment. Most authors agree that aside from definitive or a rim enhancing collection, immediate surgical drainage is also indicated in the context of complications such as jugular vein thrombosis, mycotic aneurysms, mediastinitis, and airway obstruction. Group A β hemolytic streptococci, α-hemolytic streptococci, haemophilus influenza, and β-streptococci were the most commonly identified organisms. The recommended empiric coverage includes β-lactamase inhibitors with anaerobic activity, or clindamycin. Regarding surgical drainage, an external approach to the parapharyngeal space is advocated based on ability to control the internal carotid artery and internal jugular vein. However, with CT imaging, collections medial to the great vessels are easily drained by a transoral approach. Two large pediatric case series found that in 59 cases of retropharyngeal and parapharyngeal abscesses, only twice was an external approach required for drainage; once for failure to drain purulence and once for a co-existing carotid aneurysm. A study comparing external to transoral drainage of parapharyngeal space abscesses looked at parameters such as surgical duration, length of post-operative antibiotics, and length of hospital stay after intervention. Surgical duration was the only factor of statistical significance and was decreased by 31.7 minutes in the transoral group; the authors argue that this creates less hospital cost and morbidity associated with prolonged anesthesia in the potentially septic child.

We hypothesize that the specific etiology of this acute parapharyngeal abscess after an adenotonsillectomy is related to violation of the tonsillar fossa after suture ligation of an inferior pole vessel. Three papers describe a total of five adults with a similar presentation. The first paper is a case report of a 30 year old man who developed a parapharyngeal abscess nine days after an adenotonsillectomy in which bupivicaine was used to inject the tonsillar fossa for post-operative pain control. The second paper is a Turkish retrospective case series from 1967 to 1978, in which 3 patients injected with local anesthesia for a tonsillectomy developed a parapharyngeal abscess approximately 2 weeks after surgery. The third is a case report of a fifty-three year old woman who developed a parapharyngeal abscess three days after a routine tonsillectomy without any violation of the tonsillar fossa. It is possible that seeding of bacteria into the parapharyngeal space occurred after penetration through the tonsillar fossa. Therefore, great care must be employed to avoid deep penetration into the parapharyngeal space while injecting the tonsillar fossa with local anesthetic or suture ligating vessels not amenable to electrocautery hemostasis.

References