

Surgical emergencies in pediatric otolaryngology

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ABSTRACT

الأهداف: الحصول على الإحصائيات الأولية عن أكثر الأسباب الشائعة للحالات الجراحية في طب وجراحة الأنف والأذن والحنجرة عند الأطفال في المملكة العربية السعودية.

الطريقة: أجريت دراسة استيعادية لمرضى تحت سن الثامنة عشرة ممن زاروا الإسعاف مابين الفترة يناير 2001 حتى يناير 2006 م - مستشفى الملك عبد العزيز - الرياض - المملكة العربية السعودية. تم جمع ومراجعة المعلومات للمرضى الذين احتاجوا للتدخل الجراحي في طب وجراحة الأنف والأذن والحنجرة عند الأطفال.

النتائج: احتاج 15,850 طفل لخدمة طب وجراحة الأنف والأذن والحنجرة عند الأطفال. حيث حصل التدخل الجراحي لدى 183 طفل (1.2%). كانت الحنجرة والرأس والعنق أكثر الأماكن حاجة للتدخل الجراحي. دخول الأجسام الغريبة لمجرى الهواء والبلع من أكثر الحالات التي تطلبت تدخلا جراحيا (42%). بينما كان مجرى البلع والهواء من أكثر الأماكن سببا في إخراج الأجسام الغريبة (54%).

خاتمة: يمثل الأطفال الشريحة الكبرى لطب وجراحة الأنف والأذن والحنجرة. تكون غالبية الحالات الاسعافية في طب وجراحة الأنف والأذن والحنجرة عند الأطفال حميدة. دخول الأجسام الغريبة لمجرى الهواء والبلع من أكثر الحالات الاسعافية التي تطلبت تدخلا جراحيا في طب وجراحة الأنف والأذن والحنجرة عند الأطفال.

Objectives: To obtain baseline data on the most common surgical emergencies in pediatric otolaryngology in Saudi Arabia.

Methods: This report is a retrospective study of all children presenting to the pediatric otolaryngology emergency service at King Abdulaziz University Hospital in Riyadh, Kingdom of Saudi Arabia. Between January 2001 to January 2006 data were carefully collected and then analyzed for patients requiring emergent surgical intervention by the pediatric otolaryngology service.

Results: A total of 15,850 children presented to our pediatric otolaryngology emergency service. Surgical intervention was indicated in 183 children (1.2%).

The larynx/head & neck was the most common site involved. Foreign body related emergencies were the most common presentation requiring surgical interventions (42%). The aero-digestive tract was the most common site for foreign body retrieval (54%).

Conclusion: Pediatric patients have always constituted a significant portion of the general otolaryngology service. Most pediatric otolaryngology emergencies are relatively benign. Aero-digestive tract foreign bodies are the most common indication for surgical intervention in pediatric otolaryngology.

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The emergency care needs of children differ from those of adults. Children are not young adults, is a well-known statement that emphasizes the distinction between adult and pediatric emergency medicine. In 1992, the American Academy of Pediatrics introduced pediatric emergency medicine as a subspecialty of pediatrics.^{1,2} The percentage of pediatric patients presenting to the emergency departments (ED) in the United States ranges from 10-40% of the total number of patents.³ During 2003, approximately one out of every 5 children younger than 18 years in the United States population made at least one visit to an ED.⁴ Otorhinolaryngology (ORL) emergencies are common in all communities. Due to the proximity of the airway as well as vital neurological and vascular structures to the head and neck in children, the potential for significant life-threatening complications is possible. A reduction in morbidity and mortality can only be made with early

diagnosis and proper management. Those emergencies vary from minor presentation of sore throat to severe respiratory distress. Emergency care for pediatric ORL represents one third of the total ORL emergencies.^{5,6} Pediatric ORL emergencies require excellent skills and special equipment to manage such emergencies. Complications in pediatrics might be fatal, especially when dealing with airway passages due to their small diameter. Most previous studies evaluating emergency cases in ORL included all age groups,⁷⁻⁹ and there is a lack of reports on the rates or causes of surgical emergencies in pediatric otolaryngology. In this study, we analyzed 6 years of data involving pediatric patients attending the ORL emergency service. Our main objective of this study is to develop baseline data on pediatric ORL surgical emergencies in Saudi Arabia. Such data could help in the identification of more common serious illnesses that can present to the ED in any hospital in Saudi Arabia.

Methods. This is a retrospective study conducted at King Abdulaziz University Hospital in Riyadh, Saudi Arabia from January 2001 to January 2006. Medical records were reviewed for all children attending the pediatric otolaryngology emergency service. All children aged 18 years and below, and requiring a surgical intervention under the care of pediatric otolaryngology were included. Patients who needed admission and medical therapy with no surgical intervention were excluded. Surgical procedure notes were carefully reviewed for each patient including the findings intra-operative and complications. After analysis of each case, patients were divided according to the site (ear, sinonasal, throat, larynx/head and neck), and then according to etiology (foreign body, inflammatory, bleeding, trauma) calculating the number and percentage for each site and etiology. Other data collected included patient's demographic data (for example, age and gender), date of presentation, diagnosis, site of involvement, and intervention. The ethical and research committee at King Abdulaziz University Hospital approved the study.

All statistical tests were carried out using the Statistical Program for Social Sciences (SPSS) software version 12.0 (SPSS Inc, Chicago) for Windows.

Results. A total of 214,000 patients presented to the pediatric ED during the study period. Out of those, 15,850 patients presented to the pediatric otolaryngology emergency service. Only 372 (2.3%) patients required admission under the care of the pediatric otolaryngology service (Figure 1). Indications for admission were either for close observation, intravenous antibiotics, or for surgical procedure. Surgical interventions were

indicated for 183 (1.2%) patients presenting to the pediatric ORL emergency service. The larynx/head & neck was the most common site involved (64, 35%), followed by the throat (48, 26%), the sinonasal cavity (42, 23%), and the ear (29, 16%). Table 1 provides a detailed description of children requiring emergency surgical intervention under pediatric otolaryngology. The mean age of the study population was 7.5 years. The male to female ratio was 3:1. Foreign body related emergencies were the most common presentation that required a surgical intervention (76 patients, 42%), followed by inflammation (43, 23%), bleeding (39, 21%), and trauma (25, 14%). The aero-digestive tract was the most common site for foreign body retrieval (41 patients, 54%), followed by the nose (19, 25%), and the ear (16, 21%).

Discussion. Otolaryngology emergencies are common in all communities. Previous studies by Wheatly et al¹⁰ and Gallo et al⁹ noted that 75% and 87.5%, of ORL emergency consultations were not real emergencies. The most common causes of ORL mortality were respiratory tract obstruction, intracranial complication of chronic suppurative otitis media, and foreign body in the upper aero-digestive tract.⁷

Emergency care for pediatric patients represents one third of total ORL emergencies.^{5,6} Surgical intervention is indicated in certain cases. Despite the frequency of patients presented to our pediatric ORL emergency service, few required surgical intervention (1.2%). In our study, foreign body related surgical emergencies

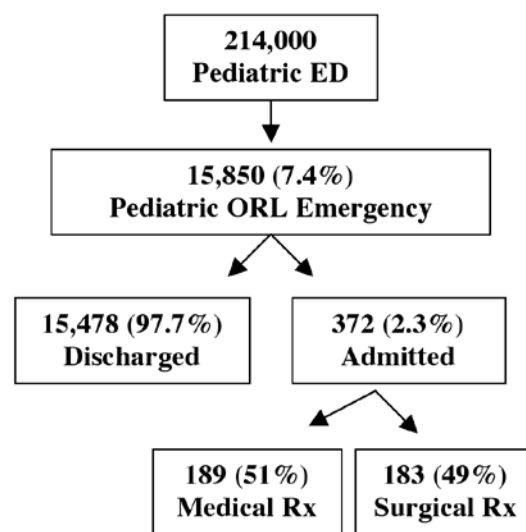


Figure 1 - Analyses of pediatric patients presenting to the emergency department (ED), ORL - Otorhinolaryngology, RX - a medical prescription.

were the most common etiology for intervention, followed by inflammatory disorders, hemorrhage, and trauma.

Accidents with foreign bodies are common in the pediatric population. In this study, foreign body related surgical emergencies constituted 42%. Foreign body in the aero-digestive tract remains a significant cause of childhood morbidity and mortality.^{11,12} In contrast to inhaled foreign bodies, ingested foreign bodies are relatively benign. Seventy-five percent of aero-digestive tract foreign bodies occur in children under 3 years of age,^{13,14} concurring with our study (68.5%). A child

with ear or nose foreign body impaction is a common presentation. Most cases were successfully removed by an ORL surgeon in the ED, whereas few cases required admission and removal under general anesthesia. The key to successful removal of ear or nose foreign bodies is by keeping the child still.¹⁵

Despite the antibiotic era, inflammatory disorders secondary to infections are still one of the most common presentations to the pediatric ORL emergency service. In our study, inflammatory disorders were the most common cause of admission and the second most common cause (23%) of surgical intervention.

Table 1-Frequency of surgical emergency cases in pediatric otolaryngology.

Site\ Disease	Procedure	Number	(%)
<i>a) Ear</i>			
Foreign body	Removal under GA	16	(8.7)
Trauma to external ear	Repair	2	(1.1)
Periauricular abscess	Incision and drainage	1	(0.6)
Acute mastoiditis	Mastoidectomy	2	(1.1)
Subperiosteal abscess	Incision and drainage	6	(3.3)
Acute suppurative otitis media	Myringotomy + tube	1	(0.6)
CSOM with acute exacerbation	Mastoidectomy	1	(0.6)
<i>b) Sinonasal</i>			
Foreign body	Removal under GA	19	(10.4)
Epistaxis	Control of bleeding	2	(1.1)
Trauma "nasal bone fracture"	Close reduction under GA	7	(3.8)
Septal hematoma	Incision and drainage	8	(4.4)
Septal abscess	Incision and drainage	3	(1.6)
Acute sinusitis with subperiosteal abscess	FESS + abscess drainage	3	(1.6)
<i>c) Throat</i>			
Post adenotonsillectomy bleeding	Control of bleeding	37	(20.2)
Oropharyngeal trauma	Repair	8	(4.4)
Acute obstructive tonsillitis	Adenotonsillectomy	1	(0.6)
Peritonsillar abscess	Tonsillectomy	2	(1.1)
<i>d) Larynx / H&N</i>			
Aero-digestive tract foreign body	DL+B / Esophagoscopy	41	(22.4)
Acute epiglottitis	Intubations under GA	4	(2.2)
Juvenile laryngeal papillomatosis	DL + laser excision	5	(2.7)
Subglottic stenosis	DL+B ± tracheostomy	4	(2.2)
Parapharyngeal abscess	Incision and drainage	2	(1.1)
Retropharyngeal abscess	Incision and drainage	1	(0.6)
Lymph node abscess	Incision and drainage	5	(2.7)
Submandibular abscess	Incision and drainage	1	(0.6)
Nasopharyngeal mass	Excision of mass	1	(0.6)
Total		183	100%
GA - general anesthesia, COSM - chronic suppurative otitis media, FESS - functional endoscopic sinus surgery, DL+B - direct laryngoscopy + bronchoscopy			

Ear inflammatory conditions were the most common ear surgical emergencies (38%). Acute otitis media presenting with mastoiditis, subperiosteal abscess, or facial palsy were the most common indications for surgery. Acute otitis media is the most common infection for which antibiotics are prescribed in children, resulting in more than 20 million antibiotic prescriptions annually.¹⁶ Acute otitis media has the propensity to become chronic and recurrent.¹⁷ Although most middle ear infections involve the mastoid air cells, a subperiosteal abscess or a Bezold's abscess nowadays occurs in less than 2% of acute otitis media episodes.¹⁸

The results of our data revealed that 14% of sinonasal surgical emergency cases were inflammatory conditions requiring surgical intervention. Acute sinusitis commonly occurs in children and accounts for almost 21% of pediatric antibiotic prescriptions.¹⁹ The most common complications of acute sinusitis are orbital involvement followed by intracranial extension.^{20,21} Surgical drainage of subperiosteal abscess either through an external approach or trans-nasal endoscopic approach is indicated in patients with large abscess, significant ocular signs, or failure to improve after 48 hours of medical therapy.²² In our study, we had 3 patients presenting with subperiosteal abscess secondary to acute sinusitis with either significant signs of ocular deficits or failure to improve after 48 hours of intravenous antibiotics. Trans-nasal endoscopic approach was the treatment of choice. Head and neck abscesses generally begin as a severe lymphadenitis in the lymph nodes draining the primary infection site, typically in the nasopharynx or oropharynx.²³

Bleeding disorders are one of the most life threatening conditions in pediatrics compared to adults due to the small total blood volume. In this study, 21% of patients presenting with bleeding required surgical intervention. Most cases (95%) were post-adenotonsillectomy hemorrhage. Post-tonsillectomy hemorrhage remains the most serious complication with the potential of becoming life-threatening, requiring revision surgery under general anesthesia for control of bleeding. The post-tonsillectomy hemorrhage may occur as primary (<2 hours) or secondary (>24 hours) up to 2 weeks after surgery. It occurs approximately in 5% after surgery, most often within 24 hours.²⁴ Repeated episodes of bleeding should be regarded as a warning sign for a high risk delayed and massive hemorrhage.²⁵ Serious post-tonsillectomy hemorrhage with or without lethal outcome occurs predominantly as secondary bleeding.²⁶

In conclusion, otolaryngology emergencies have a wide spectrum and management of each condition requires specialized skills. Pediatric patients have always constituted a significant portion of the general

otolaryngology service. The majority of pediatric otolaryngology emergencies are relatively benign. Surgical intervention is indicated in a small number of patients. Aero-digestive tract foreign bodies are the most common indication for surgical intervention in pediatric otolaryngology. Pediatric emergency department physicians are the first to deal with such emergencies. As there is a major overlap between otolaryngology and pediatrics, cross-pediatric otolaryngology training of pediatric emergency residents in Saudi Arabia would provide better health care for the pediatric population. Preventive measures and parents' education would also reduce the number of patients presenting to the pediatric ORL emergency service.

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Ethical Consent

All manuscripts reporting the results of experimental investigations involving human subjects should include a statement confirming that informed consent was obtained from each subject or subject's guardian, after receiving approval of the experimental protocol by a local human ethics committee, or institutional review board. When reporting experiments on animals, authors should indicate whether the institutional and national guide for the care and use of laboratory animals was followed.