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Deep neck space abscesses in children below 5 years of age and their complications

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ABSTRACT

Objectives: To study the outcomes and complications of deep neck space abscesses in children less than 5 years of age over a period of 15 years.
Methods: A retrospective analysis of children less than 5 years of age with deep neck space abscesses over a 15-year period was conducted at a tertiary care centre in India. Patients were evaluated with respect to the clinical, radiological and laboratory findings. All patients underwent surgical incision and drainage of the abscess and pus cultures were obtained. The incidence of complications was recorded. The collected data was tabulated and statistical analysis was done.
Results: A total of 510 children less than 5 years of age were identified who were admitted for deep neck space abscess over a 15-year period. The mean age was 23.6 months. The most common organism isolated in the pus was *Staphylococcus aureus* (21%). The incidence of methicillin resistant *S. aureus* (MRSA) was 9%. Complications were reported in 10% patients.
Conclusion: Paediatric deep neck abscesses can be managed with prompt surgical management and intravenous antibiotics. Children less than 2 years of age, and those with multiple abscesses or retropharyngeal abscess were more prone to complications.

1. Introduction

Deep neck space infections are a common clinical entity in the paediatric population. They can occur at any age, but because of their rapidly progressive nature, paediatric deep neck infections require thorough management. The onset is usually insidious, and early diagnosis may be delayed due to insidious symptoms and poor verbal communication particularly in young paediatric patients [1]. They often present with a prodromal illness with upper respiratory tract symptoms, with or without fever. This eventually progresses to neck swelling and pain, reduced oral intake, limitation in neck range of motion, with or without trismus. Management of deep neck space abscesses includes intravenous antibiotics, with surgical incision and drainage. However, despite adequate treatment, some patients may develop complications such as mediastinitis, internal jugular vein thrombosis, carotid artery aneurysm, or airway obstruction. Recent data suggest that the incidence of paediatric deep neck abscesses, as well as the associated complications are increasing in incidence [2].

This study aimed to summarize the experience with deep neck abscesses in children less than 5 years of age over a period of 15 years at a tertiary care centre in India, focussing on clinical presentation, microbiological findings and patient outcomes. There is paucity of literature on paediatric deep neck space abscesses, particularly in smaller children and from developing countries, and hence, this study was undertaken. The incidence of methicillin resistant *S. aureus* (MRSA) was also determined.

2. Methods

A retrospective analysis of children less than 5 years of age with deep neck space abscesses over a 15-year period (2000–2015) was conducted at a tertiary care centre in India. Children with abscesses of pre-auricular, post-auricular, external auditory canal, superficial skin and face were excluded. In addition, congenital neck lesions such as thyroglossal cyst, lymphatic malformations and branchial cleft abnormalities were excluded.

Patients were evaluated with respect to the clinical, radiological and laboratory findings. Data regarding age, sex, clinical presentation, predisposing factors, associated co-morbidities, duration of hospitalization, laboratory and radiological investigations, management, complications and outcomes were recorded. Diagnosis of deep neck space abscess was confirmed by ultrasonography (USG) and/or contrast

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enhanced computed tomography (CECT), with or without needle aspiration. All patients underwent surgical incision and drainage of the abscess and pus cultures were obtained. The incidence of MRSA was also determined.

2.1. Drainage of parapharyngeal abscess

A transverse skin incision was given two finger breadths below the lower border of mandible. The incision was suitably modified according to the extent of the abscess. Subplatysmal flap was elevated and anterior border of sternocleidomastoid exposed. The parapharyngeal space was entered by retracting the sternocleidomastoid muscle posteriorly. The abscess cavity was drained and all loculations were broken.

2.2. Drainage of retropharyngeal abscess

Retropharyngeal abscess was drained by transoral approach. First, the abscess was localized by aspiration. Then, an incision was made through the posterior pharyngeal wall mucosa, and the abscess was opened with blunt dissection and drained.

Statistical analysis with the Student's t-test and Chi square test was used to determine the demographic factors which were associated with increased complication rates. The criteria for statistical significance was $p < 0.05$.

3. Results

A total of 510 children less than 5 years of age were identified who were admitted for deep neck space abscess over a 15-year period. There were 309 boys (60.6%) and 201 girls (39.4%), ranging in age from 5 days to 60 months (Table 1). The mean age was 23.6 months.

Patients presented with fever (97%), neck swelling (96%), reduced oral intake/dysphagia (40%), excessive crying or irritability (37%), neck stiffness (7.6%) and respiratory distress (6.9%). The most commonly encountered site of abscess was submandibular followed by submental space (Table 1). All patients underwent surgical incision and drainage of the abscess. They were initially treated with injection amoxicillin plus clavulanate and metronidazole, which was changed in some of the patients according to the pus culture sensitivity report. The results of pus culture are mentioned in Table 1. In our study, the most common organism isolated in the pus was *Staphylococcus aureus* (overall incidence in the study: 21%). The incidence of methicillin resistant *S. aureus* (MRSA) in our study was 9%. All these MRSA cultures were sensitive to vancomycin, linezolid and cotrimoxazole. The treatment of these patients was changed to injection vancomycin.

Among the children less than 1 year of age, 40 were neonates (41.7%). All the neonates were already admitted in neonatal ICU for

Table 1
Demographic characteristics of patients in our study (n = 510).

	Number	Percentage
Age distribution (n = 510)		
< 1 year	96	18.8%
1–2 years	127	24.9%
2–3 years	98	19.2%
3–4 years	107	21%
4–5 years	82	16.1%
Site of abscess (n = 510)		
Submandibular	304	59.6%
Submental	98	19.2%
Parapharyngeal (Fig. 1)	39	7.7%
Retropharyngeal (Fig. 2)	20	3.9%
Multiple	49	9.6%
Microorganisms in pus culture (n = 510)		
No pathogen	240	47.1%
Staphylococcus aureus	107	21%
MRSA	46	9%
Streptococcus spp.	56	11%
Klebsiella spp.	6	1.2%
Peptostreptococcus	5	1%
Proteus spp	6	1.2%
Pseudomonas spp.	3	0.6%
Escherichia coli	12	2.3%
Mixed	29	5.6%
Complications (n = 51)		
Airway obstruction (Intubation/Tracheotomy)	42	8.2%
Multiple surgical interventions	7	1.4%
Sepsis	2	0.4%

Fig. 1. CECT (axial) showing left parapharyngeal abscess in a 6-months-old girl.

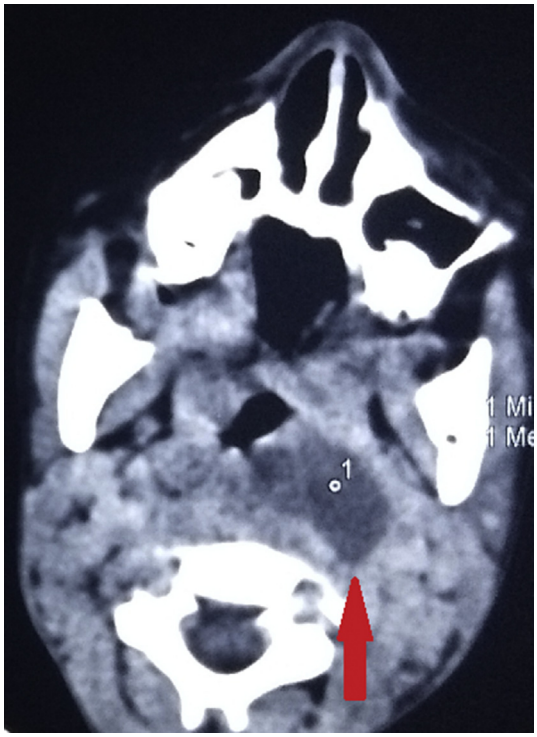

Fig. 2. CECT (axial) showing retropharyngeal abscess in a 4-year-old boy.