

Acute retropharyngeal and parapharyngeal abscesses in children

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ABSTRACT

Objective: Acute retropharyngeal and parapharyngeal abscess is a rare but serious disease in children. We reviewed our experience highlighting some of the unusual features of our cases.

Methods: Medical records of children less than 12-years-old who were admitted to King Khalid University Hospital, Riyadh, Kingdom of Saudi Arabia, over a 10-year period with final diagnosis of deep neck infection, were reviewed.

Results: Eight patient's records were reviewed. Seven were less than 3-years of age. The retropharyngeal abscess was suspected clinically in 3 cases only. The most common findings were fever, neck swelling and feeding problems. The duration of symptoms and signs were so variable. The most helpful diagnostic tests were direct visualization and computerized tomography scan of the cervical area. The combination of retropharyngeal and

parapharyngeal abscess was encountered in 4 patients. Cefuroxime was the drug of choice in all patients. Five patients responded to conservative management with antibiotics alone. Two cases had unusual presentation, one with subacute neck swelling, and one with severe airway compromise one week after manipulation of the tonsils by traditional therapist.

Conclusion: High index of suspicion is warranted in such rare and life threatening disease. Special attention should be directed to the parapharyngeal entity, which was not suspected clinically in any case. The use of traditional medicine could have serious consequences in some patients.

Keywords: Retropharyngeal, parapharyngeal, neck swelling, subacute, conservative management and traditional therapy.

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Acute retropharyngeal abscess (RPA) is a rare disease, seen in pediatric patients as a result of suppurative lymphadenitis in that area. It is usually secondary to upper respiratory tract infection, contiguous infection or trauma. Most of the studies, group retropharyngeal and parapharyngeal abscesses together since the clinical distinction is insignificant.¹ The incidence of acute RPA and other deep neck infections has fallen in recent years according to some reports^{2,3} and dramatically increased in others.¹ Since this entity is rare in general, a high index of suspicion is necessary for early diagnosis and prompt treatment to avoid potentially disastrous complications.⁴

We reviewed in our report our experience in a tertiary care center, describing the clinical presentations, diagnostic work up and management plan with the outcome, highlighting some of the unusual features of our cases.

Methods. We reviewed the medical records of all pediatric patients younger than 12 years of age with deep neck infection admitted to King Khalid University Hospital (KKUH), Riyadh, Kingdom of Saudi Arabia (KSA), over a 10 year period from July 1991 through to June 2001. Informations obtained from charts were patients' demographics, presenting

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symptoms and signs, details of workup, intra-operative findings, management and patient outcome. We filled this information in a template designed for this study.

Results. During the 10 year period, 10 children with deep neck infection were managed in our institution. One case of a 20-month-old boy with Ludwig's angina and one case of 9-month-old boy with infected cystic hygroma of the neck. The diagnosis of both cases was confirmed by computerized tomography (CT) scan findings. We managed the first case conservatively by intravenous antibiotics, while the 2nd case treatment was surgical. We reviewed the charts of the 8 patients with final diagnosis of RPA who were the subject of our study. Patient's demographic data with admission diagnoses are summarized in **Table 1**. Patient's age ranged from 7-88 months, with a median age of 17 months. Seven out of the 8 patients were less than 3 years of age, 6 boys and 2 girls. All patients were previously healthy. Six of the patients were admitted from our outpatient or emergency department while the other 2 were referred from another institution. The possible diagnosis of RPA was suspected based on the clinical presentation only in 3 cases. Two cases were admitted with a possible diagnosis of cervical lymphadenitis, one as a peritonsillar abscess, one as a croup and one as torticollis. None of the patients were suspected to have parapharyngeal abscess. Duration and nature of symptoms and signs are listed in **Table 2**.

The most frequent symptoms were fever, neck swelling, feeding problem and toxic appearance. Three out of the 7 children had noisy breathing, and one of them had significant stridor with respiratory distress mimicking croup. The possibility of associated tracheomalacia was highly likely on this patient based on the radiological findings. Only 2 patients had preceding upper respiratory tract infection. The duration of most symptoms and signs were so variable, ranging from one day to almost 2 months. The first patient was unique with rather subacute type of presentation. He had fever and neck swelling for 2 months before establishing the diagnosis by CT scan of the cervical area. The work up that was carried out to establish the correct diagnosis in our patients included a soft tissue lateral radiograph of the neck in all patients, CT scan with contrast of the cervical area in 5 patients and examination under general anesthesia in 5 patients. Simple clinical examination with visualization of the oropharynx was helpful in 4 patients. Only 2 patients had an ultrasound examination of the neck mass, mainly to look for fluid collection inside the mass. Clinical findings with the radiological correlation are summarized in **Table 3**.

Intravenous cefuroxime was the antibiotic of choice in all patients, which was combined with

Table 1 - Patients' demographics with admission diagnosis.

Age (months)	Sex	Referred	Admission diagnosis	Final diagnosis
7	Female	Other hospital	RPA	RPA & PPA
18	Male	ED	RPA	RPA & PPA
12	Male	ED	Croup	RPA
30	Male	ED	Cervical adenitis	RPA & PPA
10	Male	Clinic	Peritonsillar abscess	RPA & PPA
28	Male	Other hospital	RPA	RPA
16	Male	ED	Cervical adenitis	RPA
88	Female	ED	Torticollis	RPA

ED - emergency department, RPA- retropharyngeal
PPA - parapharyngeal

Table 2 - Duration and nature of symptoms and signs.

Clinical Feature	Affected patients	Duration prior to admission Median (range) in days
Fever	8/8	12 (1-60)
Neck swelling	6/8	4 (1-60)
Feeding problem	5/8	5 (1-7)
Toxic looking/lethargic	5/8	3 (1-7)
Noisy breathing	3/8	3 (1-7)
Limitation of neck movement	3/8	5 (3-10)
Respiratory distress	2/8	1.5 (1-2)
Preceding URTI	2/8	10.5 (7-14)
Torticollis	1/8	10

URT I - upper respiratory tract infection

clindamycin in 3 of the patients. Conservative management with intravenous antibiotics alone was successful in 5 patients, and the remaining 3 required incision and drainage via intraoral route. Our approach usually is using artificial airway with mechanical ventilation, for 24-48 hours post-operatively.

The mean number of days on antibiotics was 11.7 days with the range of 5 days to 16 days. Hospitalization days ranged from 4 days to 15 days.

Table 3 - Clinical findings with its radiological correlation.

Clinical findings	Radiological findings
Right neck swelling EUA: Bulging right posterior pharyngeal wall	<i>Lateral Neck film:</i> Large prevertebral homogenous soft tissue opacity <i>CT:</i> Large soft tissue lesions in the retropharyngeal and R parapharyngeal spaces with mass effect. Necrosis and ring enhancement present. <i>US of the neck mass:</i> Soft tissue swelling in prevertebral space with hypoechoic center suggestive of liquification
Left upper neck swelling Pharyngeal congestion EUA: Pharyngeal congestion with bulging posterior pharyngeal wall	<i>Neck film:</i> Moderate homogenous thickening of prevertebral soft tissue with another shadow bulging through the pharyngeal air tract <i>CT:</i> Large non homogenous left parapharyngeal soft tissue lesion extending into the retropharyngeal space. Necrosis and ring enhancement present. <i>US:</i> Large irregular hypoechoic oval shaped lesion in left cervical lesion casting posterior enhancement <i>Neck film:</i> Large prevertebral homogenous soft tissue swelling with anterior displacement of trachea. <i>CT:</i> No retro or parapharyngeal mass lesion. Attenuation of the trachea in subglottic region (? tracheomalacia).
Left neck swelling EUA: Pharyngeal congestion deviation of left tonsillar pillar to the right EUA: Pharyngeal congestion swelling of left tonsil pushing the epiglottis to the right EUA: Pharyngeal congestion with bulging posterior pharyngeal wall	<i>Neck film:</i> Moderate increase in the thickness of prevertebral soft tissue with loss of normal cervical lordosis <i>Neck film:</i> Widening of retropharyngeal space <i>Neck film:</i> Huge homogenous prevertebral soft tissue swelling with kyphotic deformity of the cervical spine and anterior splaying of the trachea. <i>CT:</i> Huge retropharyngeal hypodense lesion with ring enhancement
Right neck swelling Pharyngeal congestion	<i>Neck film:</i> Moderate soft tissue swelling in prevertebral space
Pharyngeal congestion Torticollis	<i>Neck film:</i> Torticollis of cervical spine with no significant soft tissue abnormality in prevertebral region. <i>CT:</i> Soft tissue swelling in the left parapharyngeal region with necrosis and some ring enhancement
EUA - exam under anesthesia, CT - computerized tomography, US - ultrasound, R - right	

Follow-up record was available for only 5 patients, and they all looked well with no clinical recurrence (Table 4).

Discussion. Suppurative lymphadenitis of the retropharyngeal and parapharyngeal spaces in children most commonly a result of infection involving sites that drain into these nodes. Those sites are nose, pharynx, sinuses and ears. This infection usually manifests in children less than 5 years of age. After that age, the lymph node in this space involutes. Since this infection commonly occurs in very young non verbalizing children, a high index of suspicion must be maintained to make the diagnosis. If left untreated, the abscess may rupture into the pharynx spontaneously, extend laterally and cause thrombosis or erosion into major blood vessels, or inferiorly and cause mediastinitis. Death may occur with aspiration, sepsis, airway obstruction, erosion into major blood vessels, or mediastinitis.^{5,6,7}

A dramatic increase in the incidence of deep neck infection was seen in a large group of pediatric

patients within the last 4 years of a 10 year period study.¹ It was speculated that the increased incidence of this infection goes along with the emergence of more virulent group A beta hemolytic streptococci in the recent years. Our patient number is not large enough to comment with regards to change in the incidence in our area. Overall, a number of important changes in the incidence and nature of the disorder has been noticed in the 20th century. It is less common nowadays than 50 years ago, it presents at a much earlier stage, it can be more accurately diagnosed with modern imaging. Antibiotic therapy is a mainstay of treatment.¹ In consequence, the rate of major complications and mortality has fallen precipitously.^{8,9} Ameh⁴ reported 2 deaths out of the 10 cases of RPA he described in his study from a developing country. We had no complications or mortality in our patients, matching what has been described lately in the West.⁹⁻¹¹

The clinical presentation of RPA can be very variable, with the most serious cases mimicking epiglottitis, a life threatening condition. Fever, toxic appearance, feeding problems and abnormal neck

Table 4 - Diagnostic approach, management and outcome.

Diagnosis confirmed using	Management	Antibiotic choice	Antibiotic duration (days)	Hospital days	Follow-up
CT, US, EUA	ID (negative culture)	Cefuroxime	5	4	NA
CT, US	Medical	Cefuroxime & Clindamycin	10	15	Well by US (10 days post)
CT, neck film, EUA	Medical	Cefuroxime then Cefaclor	14	10	Well clinically (30 days post)
Neck film, EUA	Medical	Cefuroxime	15	6	NA
Neck film, EUA	ID (negative culture)	Cefuroxime & Clindamycin	10	9	NA
Neck film, CT, EUA	ID (negative culture)	Cefuroxime & Clindamycin	NA	NA	NA
Neck film	Medical	Cefuroxime	12	5	Well clinically (42 days post)
CT	Medical	Cefuroxime	16	10	Well clinically (20 days post)

CT - computerized tomography, US -ultrasound, EUA - exam under anesthesia, ID - incision and drainage, NA - non applicable

position are the most commonly encountered presenting features in both. A recent report by Lee et al,¹⁰ labelled this entity, the retropharyngeal abscess, as the epiglottitis of the new millennium due to the similarities of presentation and the decline in the incidence of epiglottitis in the ultrasound (US) after the universal use of Hemophilus Influenza vaccine in young children. Only 2 of our patients had preceding upper respiratory tract infection, which is less than what has been previously reported in the literature.⁴ Significant swelling of one side of the neck is not well described with RPA, and it's more a presentation of parapharyngeal (PPA). Since none of our cases was suspected to have PPA, obviously this entity is not well known to the pediatrician or emergency room physician to be commonly associated with RPA. This association was strong in our group with 4 patients having both RPA and PPA, 3 patients had only RPA and one had exclusively PPA. The duration of symptoms is variable but usually short, and can be as short as 5 hours. In some patients, especially with partially treated cases, it could take weeks before establishing the diagnosis. We confirm in our cases the variability of duration described by others. It is worth mentioning here that at least 3 of our patients received antibiotics for some time before admission. This could explain the inability to identify any organism in the culture of the pus drained from those patients. The infection in the retropharyngeal or parapharyngeal space progress through 3 stages: cellulitis, phlegmon and abscess. Depends on the stage at the time of diagnosis,

medical conservative management with antibiotics alone or combined with surgical drainage of pus is needed to manage the infection. Although some experts recommend surgical management routinely for all cases with abscess formation,³ others have successfully managed with intravenous antibiotics alone.^{9,12} Our cases concur with the later reports since 5 of our patients responded to the conservative management alone, even with findings suggestive of abscess formation on CT scan in 2 of them. The choice of antibiotics is based mainly on the most likely etiologic agents. Most of the reports describing the use of a broad spectrum single agent like ampicillin/sulbactam, or a combination of 2 medication since RPA in many cases is a polymicrobial infection.¹ The cephalosporine alone, or combined by an agent covering anaerobes has been selected in our case. Although cefuroxime alone might not be adequate for anaerobic coverage, it is proven to be successful in our cases. Although CT scan alone should not be used to decide the best management option, it is still a radiological study that has high correlation with the surgical findings.¹³⁻¹⁵

Two of our cases deserve comments in this discussion. Patient number one presentation was unusually prolonged before establishing the diagnosis. Mainly this is attributed to the suspicion of cervical lymphadenitis then malignancy as the possible cause of neck swelling. The work up for this child included bone marrow aspiration and biopsy from a reactive lymph node in the neck, looking for malignancy. The young age of this child made the

appropriate good visualization of the oropharynx challenging. The 2nd case is patient number 6 who had acute tonsillitis one month before the admission, which failed to respond to one week of oral antibiotics. One week later his family took him to traditional therapist who crushed the tonsils manually, a practice that is dangerous but unfortunately still common in our region. Two weeks later he presented with huge retropharyngeal mass causing severe shortness of breath. Almost 50 cc of pus was aspirated from that abscess intra-operatively.

In conclusion, we feel that awareness of the PPA presenting with fever and neck mass and its strong association with RPA will help reaching the diagnosis of a rare but serious disease earlier. Computerized tomography scan of the cervical area is still the most informative diagnostic tool of this disease, and should be carried out upon suspicion. Delay in the diagnosis and management has negative impact on the outcome in children. While, when correctly managed, this disease should have low morbidity and mortality in modern medical practice. Pediatrician and emergency care physician who usually encounter patients with this disease first should have high index of suspicion for this potentially life threatening disease. In consultation with otolaryngologist and proper management we can definitely maintain excellent outcomes.

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