Retropharyngeal Abscess in Children: 10-Year Study

Basel Al-Sabah, MD, Hashim Bin Salleen, MD, Abdulrahman Hagr, MD, Jeanne Choi-Rosen, MD, John J. Manoukian MD, FRCSC, and Ted L. Tewfik, MD, FRCSC

Abstract

Objective: Retrospective analysis of all patients treated for retropharyngeal infection in a tertiary care pediatric hospital.

Methods: Charts were reviewed for demographic data, duration of symptoms, radiologic workup, antibiotic choice, microbiologic findings, surgical approach, complications, and duration of medical therapy. Surgical findings were correlated with computed tomographic (CT) scans.

Results: Sixty-eight patients were included in the study. Empirical intravenous clindamycin was started for a trial of conservative medical therapy. Fifty-one patients (75%) responded to medical treatment, and only 17 patients (25%) required surgical intervention. The CT scan showed a sensitivity of 43% and a specificity of 63% in this series. None of the patients with retropharyngeal infection died, had a major complication, or had a recurrence.

Conclusion: Based on the current study, we propose that all patients should be given a trial of medical treatment with intravenous clindamycin. Surgery should be reserved for those who do not respond. An extensive review of the literature is presented.

Sommaire

Objectif: Analyse rétrospective de tous les patients traités pour une infection rétropharyngée dans un hôpital de soins tertiaires pédiatriques.


Résultats: Nous avons revu 68 dossiers. La clindamycine a été essayée empiriquement dans tous les cas. Cinquante-et-un patients ont bien répondu à ce traitement et seulement 17 (25%) ont donc eu besoin d’une intervention chirurgicale. La tomodensitométrie a montré une sensibilité de 43% et une spécificité de 63%. Aucun de ces patients n’a présenté de complication significative (aucun n’est décédé) ni n’a présenté de récidive.

Conclusion: Suite à ces résultats, nous recommandons un traitement médical de clindamycine intraveineuse pour tous. La chirurgie devrait être réservée pour ceux qui ne répondent pas. Nous présentons aussi une revue de la littérature.

Key words: child, clindamycin, computed tomography, retropharyngeal infection

Retropharyngeal abscess (RPA) is a rare deep neck infection that usually affects young children. It is the most common deep neck infection in children, but the literature is scanty, and most of the publications are case reports or small series. This retrospective study was undertaken to evaluate our experience at the McGill University Health Centre. In children, abscess formation usually follows an upper respiratory tract infection with suppuration of the retropharyngeal lymph nodes. These lymph nodes usually atrophy by 3 to 4 years of age. However, the elderly and newborns can develop retropharyngeal infection.

Knowledge of the retropharyngeal space and its relationship to the other compartments is important in understanding the presentation, treatment, and complications of deep neck infections. The retropharyngeal space extends from the base of the skull to the mediastinum at the level of the first or second thoracic vertebrae. It is limited anteriorly by the buccopharyngeal fascia (the middle layer of the deep cervical fascia), laterally by the carotid sheath (its neurovascular contents), and posteriorly by the alar fascia of the deep cervical fascia.

After the age of 5 years, when the lymph nodes in this potential space have disappeared, retropharyngeal...
infection becomes less frequent. Adults presenting with this infection often have a history of a foreign-body ingestion, external trauma, or instrumentation, such as incubation or esophagoscopy. This should also raise the suspicion of an underlying illness, such as diabetes, immunodeficiency, malignancy, chronic alcoholism, or tuberculosis of the cervical spine.

A great deal of controversy exists regarding the utility of the computed tomographic (CT) scan, especially in young infants. Ring enhancement around an area of low attenuation on CT is not pathognomonic of an abscess. Even free air in the retropharyngeal area, which may be considered a sign of abscess, can be due to anaerobic infection, fistulous connection, or even a necrotic cavity of a neoplasm.

The optimal management of RPA has been the subject of debate for more than a century. Controlling the airway, administering intravenous antibiotics, and surgical drainage have markedly affected the morbidity and mortality. The early diagnosis and widespread use of antibiotics have made these infections less common today. Physicians should be aware of it and act urgently to avoid life-threatening complications. The complications include airway compromise, perforation, mediastinitis, septic shock, and aspiration pneumonia.

This study was conducted to analyze the demographic data, duration of symptoms, radiologic workup, antibiotic choice, microbiologic findings, surgical approach, complications, and duration of medical therapy. Surgical findings were correlated with CT scan results.

Methods

We performed a retrospective review of the records of all pediatric patients discharged from our institution (Montreal Children’s Hospital) with a diagnosis of RPA, cellulitis, or infection from 1990 to 1999. The age, sex, presenting symptoms, bacteriology, method of diagnosis, medical therapy, surgical therapy, intraoperative findings, culture results, and complications were analyzed, and all available CT scans were reviewed. An extensive review of the current literature was done to compare our results with those of other centres.

Results

All patients were admitted to the hospital after confirmation of the diagnosis by imaging studies, including CT. Empirical intravenous clindamycin was started for all cases. Surgical intervention was done by the otolaryngology team if the patient had no response to medical treatment after 24 to 72 hours. All patients were treated postoperatively with intravenous antibiotics followed by oral courses. Sixty-eight patients were included in the study. Fifty-one patients (75%) responded to medical treatment, and 17 patients (25%) required surgical intervention (Figure 1). The surgical approach was intraoral in 16 patients. One child required combined intraoral and external cervical incisions owing to coexisting retropharyngeal and lateral pharyngeal components.

In the medical group, the patients’ ages ranged from 6 months to 14 years, with a median age of 4.7 years. The majority of these patients (55%) were between 3 and 6 years. There were 42 (82%) boys and 9 (18%) girls. All patients were previously healthy, except 3 patients. One of them presented first with head injury but did not need intubation. The second patient had histiocytosis and tonsillectomy 1 month before the presentation. A third patient had scarlet fever followed by retropharyngeal infection.

In the surgical group, patients’ ages ranged from 2 to 12 years, with a median age of 6 years. The majority of these patients (41%) were between 6 and 9 years. There were 10 (59%) boys and 7 (41%) girls. All patients were previously healthy in this group. Figure 2 summarizes the percentage of males and females in both the surgical and medical groups. The signs and symptoms are compiled in Figure 3 and Table 1. Lateral neck radiography was requested in the majority of patients (47 patients) by the referring physicians. The retropharyngeal soft tissue was reported as edematous, but the presence of air was not demonstrated on any films.

All patients had a CT scan of the neck. The CT scans of 62 patients were available for re-evaluation. Missed CT scans either were lost or were performed outside our institution. CT findings were analyzed for their value in predicting the presence of abscess (hypodense lesion with ring enhancement). The CT scans showed a sensitivity of 43% and a specificity of 63% in this series.

Intravenous clindamycin was the drug of choice. All patients received intravenous clindamycin as empirical treatment unless they were allergic to it (4%). Throat cultures were done for 13 patients; all of them grew group A streptococcus. The duration of intravenous antibiotic therapy ranged from 2 to 15 days, with a median duration of 5 days in the medical group and 6.5 days in the surgical group. The majority of patients were discharged...
home with a single oral antibiotic (clindamycin), 7% with amoxicillin-clavulanate (Augmentin), 4% with cephalixin, and 13% with penicillin V.

None of the patients died or developed a recurrence. One patient had coexisting Kawasaki disease. Two patients were admitted to an intensive care unit for airway monitoring. One patient was left intubated after the surgical procedure for 3 days. Extubation was performed when the airway edema subsided.

Discussion

Retropharyngeal space infection occurs most commonly in children. Its incidence is declining because of the widespread use of antibiotics and improvement in medical care over the past 50 years.13 It used to be the disease of children younger than 4 years of age.10,11,14–20 Recently, many publications documented a shift of this disease toward older children and young adults.21 The mean age of our patients was 5 years. We found that boys have a higher chance of developing retropharyngeal infection than girls (3:1). This seems to be a common consensus in the literature.22–24 The reason for the preponderance of males has not been clarified until now. Boys seem to respond better to medical treatment (81:56%). The signs and symptoms of retropharyngeal infections are not specific and can mimic meningitis or epiglottitis. In this study, patients with fewer symptoms (torticollis and dysphagia) and signs (neck swelling and trismus) responded better to medical treatment.

The chief modality for evaluation of neck infections is contrast spiral CT scan carried out in the axial plane with 4 to 5 mm–thick sections.16,25,26 All of our patients had CT to confirm the clinical diagnosis. However, we found that CT has a low sensitivity (43%) and specificity (63%) in differentiating RPA from cellulitis. There is no consensus in the literature regarding CT scan characteristics of abscess versus cellulitis.27–29

But despite relative cost, radiation exposure, inaccuracy in diagnosing abscess or cellulitis, and the need for general anesthesia in some cases, CT remains the best imaging modality for diagnosing retropharyngeal infection. Because RPA is often misdiagnosed in the newborn, it must be part of the differential diagnosis for any child who has fever, anorexia, drooling, dysphagia, and/or neck stiffness. CT can map out the location, the extent of the abscess, the relationship to the vital structures, and serious complications, such as mediastinitis.30 Recently, a CT-assisted approach has been used to localize and drain RPAs.31,32 Because CT has a low sensitivity and a low specificity in detecting the presence of an abscess versus cellulitis, CT should not be used as routine follow-up.

The common predisposing etiologic factors in children below the age of 6 years for retropharyngeal infection were upper respiratory tract infections. Although our study of throat cultures was limited to 13 (19%), all of our cultures grew group A β-hemolytic streptococci. In the literature, β-hemolytic streptococci group A is the single most commonly isolated pathogen cultured in pediatric retropharyngeal infections.10,13,27,33 Kirse and Robertson reported on the increased incidence of group A β-hemolytic streptococcus in children over 5 years of age diagnosed with RPA.34

Although this study did not identify all of the etiologic microorganisms and their sensitivity pattern, the great response to clindamycin makes it the drug of choice for empirical use. It should be given for 5 days intravenously followed by 10 days per os on an outpatient basis. Other authors have recommended using ampicillin-sublactam as a single therapy for a mean of 5.5 days before changing to an oral antibiotic for a mean

---

**Figure 2** Gender distribution of all patients.

**Figure 3** Temperature in the medical and surgical groups. Rx = treatment.

**Table 1** Symptoms and Signs of Retropharyngeal Abscess in 68 Children

<table>
<thead>
<tr>
<th>S/S</th>
<th>Medical Rx (%)</th>
<th>Surgical Rx (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>45 (88)</td>
<td>15 (88)</td>
</tr>
<tr>
<td>Torticollis</td>
<td>18 (35)</td>
<td>7 (41)</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>3 (6)</td>
<td>4 (24)</td>
</tr>
<tr>
<td>Neck swelling</td>
<td>16 (31)</td>
<td>12 (70)</td>
</tr>
<tr>
<td>Trismus</td>
<td>11 (22)</td>
<td>4 (24)</td>
</tr>
<tr>
<td>Sore throat</td>
<td>28 (55)</td>
<td>9 (53)</td>
</tr>
<tr>
<td>Drooling</td>
<td>7 (14)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Rx = treatment; S/S = symptoms and signs.
total of 15 days.\textsuperscript{35} It has been reported that up to 25% of retropharyngeal infection may be successfully treated with antibiotics alone.\textsuperscript{18,31} This small percentage of retropharyngeal infection may be successfully treated with antibiotics alone.\textsuperscript{18,31} Seid AB, Dunbar JS, Cotton RT. Retropharyngeal abscesses in children revisited. Laryngoscope 1979;89:1717–24.

\textbf{Conclusion}

This study represents one of the largest series of pediatric RPAs in the modern medical literature. It yields important insights about several aspects of this disorder and its treatment.

Retropharyngeal infection is a rare disease with serious complications. The clinician must have a high degree of suspicion for the diagnosis. Based on the current study, we propose that all patients should be given a trial of medical treatment with intravenous clindamycin and that surgery should be reserved for those who do not respond.

\textbf{References}