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Paediatric acute retropharyngeal abscesses: An experience

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ABSTRACT

Background: To describe our experience of paediatric patients with acute retropharyngeal abscess in terms of clinical presentation, diagnosis, management and complications. **Materials and Methods:** A prospective study was done for a period of 4 years (Jan 2009 to Jan 2013) on paediatric patients (< 15 years) with acute retropharyngeal abscess at two tertiary hospitals in Srinagar. Diagnosis was made on the basis of X-ray, CECT scan findings and confirmed on incision and drainage. Pus was aspirated from all patients and sent for culture and sensitivity. Data for clinical presentation, X-ray, CECT scan findings, causes, complications, bacteriology and management were collected. Thirty-five abscesses were drained while 5 with small abscesses on CECT were managed conservatively. **Results:** A total of 40 patients were diagnosed as acute retropharyngeal abscesses. Males were commonly affected, and most of the patients were less than 6 years of age. Most common symptom at presentation was fever (35) followed by neck pain (30) Dysphagia/odynophagia (22), swelling in neck (19). Most common clinical sign observed was oropharyngeal swelling and limitation of neck movements (30), cervical swelling/lymphadenopathy in 22 patients. Torticollosis and drooling were seen in 15 patients. Complications were seen in 8 patients. Most common X-ray finding was pre-vertebral thickening. Success rate with primary surgical drainage was 95% while 3 patients in conservative group failed. **Conclusion:** Children with RPA most commonly present with restricted neck movements, fever and cervical lymphadenopathy, and rarely with respiratory distress or stridor. Surgical intervention is necessary for most of these patients.

Key words: Abscess, clindamycin, incision and drainage, MRSA, retropharyngeal

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INTRODUCTION

Deep infections of the head and the neck have been recognized since the time of the Greek physician Galen.[1] According to Holmes (1907), Galen referred to a case of retropharyngeal abscess.[1] 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 or retropharyngeal space of Gillette or the posterior space of Grodinski, or Holyoke's space lies behind the pharynx between the buccopharyngeal fascia, which covers the constrictor muscle, and the pre-vertebral fascia. It extends from the base of the skull to the tracheal bifurcation.[2] The space is divided into two lateral compartments (the space of Gillette) by a fibrous raphe. Lymph glands lie in the space on either side; they are arranged in 4 groups, 2 on each side of the midline. It is claimed that the lateral group of the two is the most important. They are the ones constantly present in children and give rise to abscess formation. These lymph nodes are prominent in young children but involutes by the age of 4 or 5 years of life, although some suggest that this occurs around puberty. Acute retropharyngeal abscess occurs mainly in infancy and in children usually under 4-5 years of age. Ninety percent of cases occur before the age of 6 months.[2] In children and infants, acute retropharyngeal abscess is usually non-traumatic abscess caused by suppuration of the retropharyngeal lymph nodes, which drain from the nasopharynx, oropharynx, nose, paranasal sinuses, adenoids and tonsils. Rarely, retropharyngeal abscesses in children might also result from mastoid infection. Even rarer is the acute non-tuberculous osteomyelitis of the cervical vertebrae.[3] Waugh regards the tonsil as the source of infection, as the condition is never found in children whose tonsils have been removed.[3] Definite enlargement of the tonsils is present in about 80% of patients who suffer from retropharyngeal abscess.[3] Regional trauma, foreign body ingestion, complication

of procedures, or an immunocompromised state account for the majority of adult cases. As the retropharyngeal space communicates with the parapharyngeal space and the posterior mediastinum, any infection within the retropharyngeal space can spread to these areas.

Usually, the presentation is similar to epiglottitis with fever, stridor, drooling, and sometimes meningismus, and it was recently dubbed the "epiglottitis of the new millennium".[4] Other features include neck swelling, cervical adenopathy, retropharyngeal bulge and severe obstructive sleep apnoea. Other authors emphasize non-specific symptoms (refusal to eat, irritability, and tenderness and tachypnoea). Heightened suspicion for RPA should occur with the child who will not fully extend his or her neck to look up, and this sign is known as "Bolte's sign".[4]

Diagnosis of RPA is based on clinical suspicion with supportive imaging studies. Plain radiographs show widened pre-vertebral soft tissues on lateral view of the neck. In addition, the cervical spine may also be straightened with loss of the normal lordosis (so-called Ram Rod spine).[5] Computed tomography (CT) is also useful in diagnosing this illness and is now the preferred imaging technique.

The optimal management of RPA has been the subject of debate for more than a century. Treatment of children who have a diagnosis of RPA is evolving. Traditional management of RPA has been surgical drainage of the pus collection, with intraoral incision and drainage currently the preferred technique, yet some cases are managed with antibiotics alone.[4]

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.

In this paper, we present our experience of 40 cases of acute retropharyngeal abscesses in terms of clinical presentation, the complications, and the contemporary means of diagnosis and management.

MATERIALS AND METHODS

This prospective study was done in India in the Department of Ear, Nose and Throat and Head and Neck Surgery of Sheri-Kashmir Institute of Medical Sciences Medical College and Government Medical College Srinagar for a period of 4 years from Jan 2009 to Jan 2013.

Proper consent was taken from patients, but IRB approval was not necessary in this prospective study.

Inclusion Criteria

Forty paediatric patients up to 15 years of age were enrolled in the study who fulfilled all of the following 3 criteria:

1. Clinical signs and symptoms of acute retropharyngeal abscesses
2. X-ray suggestive of acute retropharyngeal abscess. (If X-ray lateral view neck showed two of the following features, we took it as retropharyngeal abscess:

Pre-vertebral soft tissue thickening (soft tissue that is wider than more than 50% of the width of body of any cervical vertebrae)

Straightening of normal cervical lordosis

Gas or a visible fluid in pre-vertebral shadow

Subluxation

3. Contrast-Enhanced Computed Tomography (CECT) criteria of the abscess (well-formed ring enhancement round a non-enhancing density consistent with fluid)
4. Abscess on surgery and/or abscess on needle aspiration

Exclusion criteria

All patients who had X-ray and/or CECT evidence of abscess, but which failed to show presence of abscess at the time of incision and drainage:

About 0.3 ml pus was aspirated in all cases and sent for culture and sensitivity. If greater than (85 %) of organisms in a particular group were sensitive to a specific drug, they were defined as sensitive (S) or were otherwise considered resistant (R).

All patients were started on empirical intravenous antibiotic therapy of clindamycin and ceftriaxone after needle aspiration for culture and sensitivity.

Thirty-five patients were treated surgically with I and D via intraoral route. Five patients with small abscesses on CECT were treated conservatively.

Failure to respond to initial incision and drainage included those patients who showed: No improvement of neck mobility, increasing fever or continuing fever, no improvement in physical activity, continuing pain,

refilling of aspirated cavity and no improvement in oral intake.

Once culture results were available; antibiotics were modified according to culture results only in case of non-response to empirical antibiotics.

Duration of intravenous antibiotic therapy, subsequent duration and type of oral antibiotic therapy and length of hospital stay were determined by the clinical response of the patient and our clinical judgment.

RESULTS

In 4 years, 40 patients fulfilled our criteria.

There was a predominance of males in our study who comprised 63% study population (25 males, 15 females). Most of the patients (17) were younger than 3 years at diagnosis while next common age group was 4-7 years (11 patients) [Table 1].

No. of patients seen in first year of study were 18 followed by 13 and 9 in subsequent second and third year. Most of our patients (28) were seen in the winter months.

Different clinical signs and symptoms were seen in our study. Most common symptom at presentation was fever (35) followed by neck pain (30), dysphagia/odynophagia (22), swelling in neck (19) [Table 2]. Mean duration of symptoms prior to admission were in the range of 1-12 days.

Most common clinical sign observed was oropharyngeal swelling and limitation of neck movements (30), cervical swelling/lymphadenopathy in 25 patients. Torticollis and drooling were seen in 15 patients. Stridor was seen in 6 patients and 2 of them required tracheostomy. Tracheotomy rate was 5%. Respiratory difficulty was seen in 7 patients (18%) [Table 3].

Cultures were negative in 6 patients while polymicrobial in 19 patients. Gram positives were seen in 28 patients while gram negative infection in 20. MRSA as the single most common organism was found in cultures from pus in 28 patients (70%) followed by *Klebseilla* (20) and E. coli (14). Bacteroides were the most common anaerobic organisms cultured (13) followed by *Fusobacterium* (10) [Table 4]. MRSA was sensitive to clindamycin, gentamycin, linzeolid and vancomycin. The antibiotic sensitivity is shown in [Table 5]. Five patients developed

Table 1: Showing age and sex distribution of patients

Age groups	Male	Female
0-3	11	6
4-6	7	4
7-9	3	3
10-12	2	1
13-15	2	1
Total	25	15

Table 2: Distribution of symptoms

Symptoms	No. of patients	Percentage
Fever	35	86
Respiratory difficulty	7	18
Drooling	15	38
Swelling in neck	19	48
Sore throat	14	35
Torticollis	15	38
Refusal to feed	10	25
Dysphagia/ odynophagia	22	55
Neck pain	30	75

Table 3: Distribution of signs

Signs	No. of patients	Percentage
Stridor	6	15
Torticollis	15	38
Limitations of neck movements	30	75
Tenderness	10	25
Oropharyngeal swelling	30	75
Cervical lymphadenopathy (swelling neck)	25	63
Respiratory difficulty	7	18
Drooling	15	38

Table 4: Distribution of organisms in pus culture

Organism in pus culture	No. of patients	Percentage
GRAM NEGATIVE		
Klebsiella pneumonia	20	50
E. Coli	14	35
Salmonella enteritis	3	8
H. Influenza	4	10
GRAM POSITIVE		
MRSA	28	70
Staphylococcs aureus	12	30
Streptococcus pyogens	10	25
Streptococcus pneumonia	6	15
Streptococcus agalactie	4	10
ANAEROBES		
Fusobacterium	10	25
Bacteroides	13	33
Peptostreptococcus sp	12	30
Actinomyces	3	8
Clostridium gp	3	8
Acinetobacter	4	10

Table 5: Sensitivity of organisms to common antibiotics

	Clindamycin	Gent	Vanc	Trime+Sulfa	Amox+clavu	Met.	Cipr.	Ceftria.	Linzeolid.
Klebseilla Pneumoniae	R	S	R	R	R	R	S	S	R
Salmonella enteritis	R	S	R	R	R	R	S	S	R
H. Influenza	R	S	R	S	R	R	S	S	R
Staph aureus	S	R	R	R	S	R	R	R	R
E. coli	R	S	R	R	R	R	S	S	R
MRSA	S	S	S	R	R	R	R	R	S
Streptococcus pyogens	S	R	R	R	S	R	R	R	S
Streptococcus Pneumonia	R	R	R	R	S	R	R	R	S
Peptostreptococcus	S	R	R	S	S	S	R	R	R
Bacteroides	S	R	R	R	S	S	R	R	S
Fusobacterium	S	R	R	R	R	S	R	R	R
Actinomyces	S	R	S	R	R	S	R	R	R

complications. Two patients had stridor, which needed tracheostomy. Septicaemia, mediastinitis and jugular vein thrombosis were seen in one patient each. MRSA was seen in all except jugular vein thrombosis [Table 6].

There were many apparent causes of acute retropharyngeal abscesses. Rhinosinusitis (12) and tonsillitis (7) were the most common apparent cause for retropharyngeal abscess. Cause remained unknown in about 15 patients [Table 7]. Most common X-ray finding was pre-vertebral thickening seen in 37 patients with confirmed surgical abscess followed by straightening of normal lordotic curve of cervical vertebra (30), air fluid level (22) [Table 8].

X-ray features of acute retropharyngeal. Abscesses were seen in 58 patients, but on surgery, only 40 such patients turned as abscesses. Among 57 patients with X-ray features of abscess, only 48 showed CECT features of abscess, which on surgery proved to be abscess in 40 patients. False-positive of CECT was 17% while false-positive rate of X-ray was 30% [Table 9]. Blood cultures were positive in only 1 patient. Thirty-five patients went surgical intervention while 5 patients with small abscesses were managed conservatively. Out of 35 abscesses, 2 patients were re-explored, and out of 5 patients in conservative group, 3 continued to have signs and symptoms after 48 hours, and surgical incision and drainage was done. Success rate with primary surgical drainage was 95% and with conservative management was 40%. So altogether, 38 patients went incision and drainage.

The length of hospital stay ranged from 2-14 days with mean 7 days. There were no deaths. Both patients with septicaemia and mediastinitis survived but were kept in hospital for 14 days.

Table 6: Complication seen in patients

No. of patients	Complications
Septicaemia	1
Mediastinitis	1
Tracheal compression	none
Aspiration pneumonia	none
Stridor requiring tracheostomy	2
Jugular vein thrombosis	1

Table 7: Causes of retropharyngeal abscesses

Cause	No. of patients	Percentage
Unknown	15	38
Foreign body	2	5
Tonsillitis	7	18
Rhinosinusitis	12	30
Acute lymphadenitis Trauma due to pencil in mouth	4	10

Table 8: X-ray features seen in patients with both CECT evidence and surgical abscess

Features	No of patients	Percentage
Pre-vertebral soft tissue thickening	37	93
Straightening of normal cervical lordotic	30	75
Gas or a visible fluid level within an abscess cavity	22	55
Subluxation	1	2.5

Table 9: Comparison of X-ray, CT and abscess on surgery

X-ray suggestive of Abscess	CECT Suggestive of abscess	Abscess on surgery
n=57	n=48	n=40

DISCUSSION

In the current study, acute retropharyngeal abscesses were more frequent in our younger study children with 70% occurring in the ones under the age of 6 years. Our

findings are similar to Yeoh *et al*.[6] who reported 16 cases of retropharyngeal abscess, and all of them were younger than 6 years. Dodds and Maniglia[7] reported a mean age of 26.3 months in 9 patients with retropharyngeal abscess. A review of 30 cases of retropharyngeal abscess over an 11-year period in Nigeria found the median age to be 21 months, and 77% of patients were younger than 5 years.[8] It is claimed that younger children are more likely to develop infections in this area because of the presence of lymph nodes in the retropharyngeal space and which spontaneously involutes by the age of 4 or 5 years of life. This regression with increasing age lowers the disease risk.

Males in our series predominated as reported by others series.[9,10] This seems to be a common consensus in the literature.[9] The reason for the preponderance of males has not been clarified until now. We believe, at least the reason in our population is that males are lucky to be brought to tertiary centre from far away rural centres.

The presenting features of acute retropharyngeal abscesses are highly variable and illustrate the difficulty in making a diagnosis based on symptoms alone. The signs and symptoms of retropharyngeal infections can mimic meningitis or epiglottitis. Most common symptom at presentation in our study was fever (86%) followed by neck pain (75%), dysphagia/odynophagia (55%), swelling in neck (48%). Most common clinical signs observed were oropharyngeal swelling and limitation of neck movements (75%), cervical swelling/ lymphadenopathy in (63%) of patients. Torticollis was seen in 38% of patients. Our findings are similar to other series in terms of fever as being the most common symptom. Nwaorgu OG *et al*.[8] in their study found that the major complaint was fever (87%) followed by respiratory distress. Galia Grisaru-Soen *et al*.[11] found the most common symptoms at presentation as fever (n = 27, 70%) and neck pain (62%). SI Adeleke *et al*.[10] in a study found fever (93.5%) as the most common symptom followed by respiratory distress (90.6%), cough (87.5%) and neck pain/swelling (81.2%).

Only 6 of our study children (15%) had stridor, and only 2 patients with stridor (5%) required tracheotomy. Respiratory difficulty was seen in 7 (18%) patients. RPA is frequently listed in the differential diagnosis for stridor or airway obstruction. In contrast to our series, Coulthard and Isaacs[12] found stridor in 71% of patients who were younger than 1 year and in 43% of patients who were older than 1 year. Stridor was present in 23% of patients in the series of Thompson and Cohen,[13] whereas Morrison and Pashley[14] noted stridor or airway obstruction in most of their patients. The recent experience of another children's hospital noted no cases of respiratory distress while the patients were awake, and another large recent series found respiratory findings in 3% of the study patients.[11] This infrequency of respiratory signs seen in our and other series represents a significant departure from classic teaching. The absence of evolving airway obstruction might be attributable to a changing spectrum of the disease or, more likely, to earlier diagnosis before airway compromise.

Limitation of neck movement and cervical lymphadenopathy was seen in 75% and 63% of our patients, respectively. Because respiratory difficulty and stridor are rare, restricted neck mobility in a child with fever and cervical lymphadenopathy should be the sentinel clinical clue to a diagnosis of RPA.[11]

Torticollis was seen in 38% of patients. Retropharyngeal abscess can present as torticollis in 67% of cases due to spasm of the neck while in other study, torticollis was seen in 33% of cases of acute retropharyngeal abscess.[15] Indeed, a recently published report described a rare case of retropharyngeal abscess complicated by torticollis in a 9-month-old infant and in a 4-year-old girl.[15] Most often, the infections are polymicrobial (gram-positive, gram-negative, aerobic and anaerobic), and beta-lactamase-producing organisms must be anticipated. Gram-positives were seen in 28 patients. Most common Gram-positive was MRSA followed by *Staph Aureu* . MRSA was the most common organism found in our study seen in 28 (70%) of patients followed by *Klebseilla* and *E. coli*. Gram-negatives were seen in 20 patients. Anaerobes were seen in 13 patients (33%). Cultures were polymicrobial in 48% patients. Gianoli *et al*.[16] reported polymicrobial infection in 75% of retropharyngeal abscesses cultured in their series while one study[17] showed absence of polymicrobial infection. Brook[18] reported 14 children with RPA who underwent needle aspiration.

All 14 patients were found to have anaerobes, and 12 of the 14 had mixed flora with alpha and gamma haemolytic streptococci, *S. Aureus*, *H. Influenza* and group A haemolytic streptococci being the predominant aerobes. Cultures did not reveal growth in 6 (15%) of patients. This may due to the fact that many of our patients had received at least one course of antibiotics prescribed by their general practitioners before presenting to our hospital

Recently, concern has emerged regarding the increasing incidence of MRSA infections presenting in the

paediatric population. We also found MRSA in high number of patients (28 patients out of 34 cultures). The rising incidence of MRSA in paediatric neck abscesses has been linked to increasing morbidity.

MRSA in our study was sensitive to clindamycin, gentamycin, vancomycin, linzeolid similar to study by Kathryn Ossowski *et al*.[19] and resistant to Trimethoprim- Sulfamethoxazole. Contrary to what we have seen, Trimethoprim- Sulfamethoxazole has been recommended by the Committee on Infectious Diseases of the American Academy of Paediatrics[20] as useful therapy for mild skin and soft-tissue infections caused by CA-MRSA, and in study by kathyrn Osswoski *et al*.,[19] all MRSA isolates were sensitive to Trimethoprim- Sulfamethoxazole and cefuroxime.

Despite the widespread use of antibiotics, life-threatening complications can still result from deep neck abscesses as seen in our study. A due consideration should be given specially to MRSA when starting empirical antibiotic therapy. Empirical antibiotics should cover Gram-positives, gram-negatives and anaerobes in view of polymicrobial nature of these abscesses.

The exact incidence of complications in children with deep neck space abscesses is unknown. Overall, the complication rate in our study was 13%. The most common complication in our study was stridor requiring tracheostomy seen in 2 patients followed by sepsis and mediastinitis in 1 each patient. Internal jugular vein thrombosis was seen in 1 patient.

We found a high incidence of MRSA infection in patients who had complications. Out of 5 patients with complications, 4 patients had MRSA infection. Both of our patients who had mediastinitis and septicaemia had MRSA, and 2 patients with stridor had MRSA. In a retrospective review of paediatric neck abscesses, Thomason *et al*.[21] found 3 cases of mediastinitis associated with MRSA deep neck space infections. Wright *et al*.[22] reported that 75% (6/8) of children with positive MRSA cultures from retropharyngeal abscesses developed mediastinitis. Wright *et al*.[22] concluded that MRSA is a more invasive pathogen with greater potential for complications compared to other bacterial isolates. We are also of the same opinion, because about 80% (4 out of 5) of patients with complications had MRSA infection. We would like to add that MRSA is not commonly suspected, and empirical antibiotics are not directed against MRSA, which in turn leads to untreated MRSA infection leading to complications.

In our study, the cause of infection remained unknown in maximum number of patients; 38% probably because deep neck space infections followed the inciting infection by a week or so, which is similar to reported studies who have found that the cause may be unknown in 42.7%[23] and 50%[24] of patients, respectively. Rhinosinusitis was seen in 30% of patients. Foreign body was seen in 2 patients, and especially there were 4 patients (10%) who had pencil injury to posterior pharyngeal wall. Small children tend to keep pencils in mouth, and accidental fall with pencil in mouth causes accidental injury to posterior pharyngeal wall.

Plain lateral radiographs are useful in the diagnosis of acute retropharyngeal abscess. Pre-vertebral soft tissue thickening is seen in acute retropharyngeal abscess on X-ray. Certain radiological criteria's have been laid down for significant pre-vertebral thickening. The thickness of pre-vertebral soft tissue measured at the C2–C3 sagittal level is compared with the sagittal diameter of C2 at its lower border.[16] The maximum normal ratio is 1.0 at birth to age 1 yr and decrease to 0.4 at ages 6-10 years. Another method has defined the normal sagittal soft tissue limits of the pre-vertebral soft tissue in a child as between 4 and 7 mm at the C2 level and less than 14 mm for children at the anterioinferior aspect of C6. Additionally soft tissue that is wider than more than 50% of the width of body of any cervical vertebrae should be thoroughly investigated.[16] In addition to showing pre-vertebral soft tissue thickening, lateral neck radiographs can show straightening of normal cervical lordotic curve resulting from muscle spasm as seen in our cases, gas or a visible fluid level within an abscess cavity and the presence of a foreign body. The degree of muscle spasms from acute inflammation may be so great as to suggest subluxation as seen in one of our case. All radiographs must be obtained in true lateral position and must be obtained in maximum extension (because this appearance of widened pre-vertebral soft tissue can be mimicked by flexing the neck) and in the inspiratory phase of respiration. Other source of error can result from crying, swallowing or expiration, which can cause thickened retropharyngeal space.[16] False-positive rate for X-ray detection of abscess was 30% in our study while in one study, lateral radiograph of the neck when performed had 88% sensitivity in diagnosing retropharyngeal abscess.[12]

Contrast-enhanced CT scan carried out in the axial plane with 4- to 5- mm thick sections is standard means of imaging and helps in differentiating cellulitis from abscess, though in some cases, this may be difficult.[9]

CT characteristics of an abscess include low attenuation (low Hounsfield units), contrast enhancement of the abscess wall, tissue oedema surrounding the abscess, and a cystic or multiloculated appearance. However, there is no consensus in the literature regarding CT scan characteristics of abscess versus cellulitis.[9] The sensitivity of CECT was 90%[25] and 43%,[9] but specificity was 60%[25] and 63%,[9] in some studies, and it is hard to differentiate abscess from cellulitis or lymphadenopathy. False-positive rate in our study was 17% while in one study, the false-negative rate and the false-positive rate were 13% and 10%, respectively.[4] In one study, CT scans were highly sensitive in diagnosing an abscess (92%) but not specific.[11] There is no consensus in the literature regarding CT scan characteristics of abscess versus cellulitis. The accuracy of the CT ranges between 63% and 95%.[11] The accuracy of CT was calculated by Courtney *et al*.[26] who compared the CT findings within the preceding 24 h of surgery and with the surgical findings in 8 children. The CT finding of an abscess was accurate in 6 of them, yielding an accuracy of 75% in correctly identifying an abscess and a false-positive rate of 25%. We think that CT is useful for diagnosing retropharyngeal infection, for indicating the presence or absence of an abscess, for ruling out other pathology and for serving as a reference for abscess relations if surgical drainage is being contemplated.

Subluxation was seen in one of our patients. There was no involvement of spinal cord in this patient. Motor and sensory functions were normal. Subluxation is also seen in few patients with acute retropharyngeal abscess, cervical adenitis and upper respiratory tract infection as seen in series of Mackay in 1957[27] and Watson-Jones and Roberts in 1934.[27] Sulamaa (1949)[27] reviewed the literature and published two further cases. Spinal cord was also not affected in our case. Spinal cord is not affected in many patients as seen in many series of subluxation due to infective causes like series of Mackay[27] and Watson-Jones and Roberts.[27] The cause of the dislocation is softening of ligaments allowing greater movement at the joint and also hyperaemia of the retropharyngeal tissues, the retropharyngeal lymph nodes and the vertebral ligaments. These ligaments are weakened by the hyperaemia so that minimal trauma or even normal movements are sufficient to produce the dislocation. Thereafter, spasm of the cervical muscles prevents further deformity.[27] Subluxations can be corrected by the simplest method of appropriate head traction.

MRI has not been shown to be more successful than CT in distinguishing cellulitis or phlegmon from a true abscess collection. MRI scan can, however, elegantly show vascular complications such as venous thrombophlebitis or carotid artery narrowing.[28]

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.[9] For abscesses associated with airway obstruction, septicaemia or complications and for those that fail to respond to needle aspiration, incision and drainage are indicated. For uncomplicated head and neck space abscesses, the choice of using intravenous antibiotics alone versus needle aspiration or incision and drainage plus intravenous antibiotics is up to clinician although incision and drainage is strongly recommended.[28] It has been reported that up to 25% of retropharyngeal infection may be successfully treated with antibiotics alone.[9]

Out of 35 abscesses, 2 patients were re-explored, and out of 5 patients in conservative group, 3 continued to have signs and symptoms after 48 hours, and surgical incision and drainage was done. Our results show more response to surgical treatment (94% success rate) and 40% success rate with conservative management. In Pittsburgh series of 18 children with RPA, 12 (44%) were successfully treated with antibiotics only.[29] In the Utah study[4] of 64 paediatric patients with RPA, 27 (42%) underwent surgery and 37 (58%) were treated successfully with antibiotics alone. Keeping in view our success rates with incision and drainage and failure rates with conservative, we believe, once abscess is formed, whatever be the size, it should be drained by surgical incision and drainage. Our belief is similar to what Kathyn Ossowski *et al*.[19] believe. They also tend to approach all abscesses with incision and drainage, because this seems to minimize time in the hospital and accelerates resolution.

For incision and drainage, a trans-oral approach is used. External approach is carried out if the infection also involves parapharyngeal space, if the child has early recurrence of the abscess or if the abscess does not resolve rapidly after a trans-oral drainage. On rare occasion, both approaches are used. In children, a stable airway must be maintained. Airway stability may be accomplished when necessary by endotracheal intubation or tracheostomy. Most of the time, intubation is possible in patients with RPA. Intubation must be performed with great care to prevent rupture of the abscess, and it is essential to have the head in a dependent position to prevent aspiration. However, in cases of difficult intubation due to the large swelling of the posterior pharyngeal wall, which obstructs the view of the laryngeal inlet, tracheostomy

is indicated. In our series, 5 patients underwent emergency tracheostomy under local anaesthesia due to upper airway obstruction at the time of presentation. A tracheostomy was performed to secure the airway in patients with large abscess.

CONCLUSION

Retropharyngeal space infections and subsequent formation of abscesses occur despite the advent of antibiotics; it remains an important condition as it may potentially lead to life-threatening complications, especially so when there is a delay in diagnosis and treatment, and immunosuppression. Presenting symptoms can be variable, but most patients will have neck pain, sore throat and fever associated with findings cervical lymphadenopathy, limitation of neck movements and torticollis. Our clinical experience diminishes the importance of respiratory distress or stridor as a definitive finding. Our data support the notion that MRSA infections are on the rise, and due consideration should be given to it when approaching a paediatric patient with acute retropharyngeal abscess. It is important to consider the rising incidence of MRSA when choosing empirical antibiotic. Cultures are critical to determine the organism and its possible resistance patterns. Empirical antibiotics should cover gram-positives, especially MRSA, gram-negatives and anaerobes. The choice of empirical antibiotic depends on the local sensitivity pattern. We, in our set up, start with clindamycin and ceftriaxone; this regimen covers Gram-positives, negatives and anaerobes. Vancomycin should be reserved only for severe cases with systemic manifestations and when the organism is clindamycin-resistant. Antibiotics should be modified once culture results are available. Once abscess is suspected by CECT and clinical findings, we believe it should be drained by proper surgical procedure. Retropharyngeal abscesses most commonly occur as a result of some infective focus in the pharynx, oral cavity. After the abscess has been treated, the infective focus should be looked for and treated so that recurrences can be prevented.

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