CASE REPORT

Zygomatic haematoma in an 11-month-old helps diagnose retropharyngeal abscess, with concurrent tonsillitis and subsequent infant tonsillectomy

David H Collis, Ameeth Sanu

Department of Otolaryngology,
Morriston Hospital, Swansea,
UK

Correspondence to

Dr David H Collis,
David.Collis@wales.nhs.uk

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SUMMARY

An 11-month-old boy presented with a 2-day history of non-specific symptoms and a zygomatic haematoma. With aetiology uncertain after admission clerking and blood tests, a CT head scan was arranged for suspected traumatic injury and revealed a retropharyngeal abscess (RPA) with significant airway narrowing in the transverse plane. The patient received urgent intraoral abscess drainage and bilateral tonsillectomy in theatre. This case highlights the need for a high index of suspicion regarding RPAs. These abscesses have potentially fatal sequelae and are difficult to diagnose in the infant paediatric population.

BACKGROUND

Retropharyngeal abscesses (RPAs) are deep space neck infections, most commonly found in patients from 6 months to 6 years of age. In uncomplicated cases with early diagnosis, the prognosis for complete recovery is excellent. However, history taking in this patient population is challenging, with the majority of symptoms constitutional and vague often delaying diagnosis. When not diagnosed and promptly treated, RPAs have significant morbidity and mortality rates.¹ Most urgently, they are associated with airway compromise through mass effect, and abscess rupture causing aspiration pneumonia or asphyxiation. Additionally, the anatomy of the surrounding tissues facilitates the spread of RPAs to important adjacent structures, risking mediastinitis, carotid artery rupture and osteomyelitis of the spinal cord.

Here, due to recent facial trauma, a CT head scan was performed and fortuitously led to diagnosis. This prevented a lumbar puncture for suspected meningitis in the short term and the potentially fatal consequences of missed diagnosis in the longer term.

CASE PRESENTATION

The patient presented with malaise, anorexia and vomiting over 2 days and a non-tender dark haematoma in the zygomatic region. An unwitnessed fall 4 days previously was reported. The first 2 days postfall the patient was well, with no loss of consciousness, drowsiness or anorexia and adequate oral intake.

A respiratory rate of 44 and pulse of 156 were near the upper limits of normal for his age. He was apyrexial at 35.9°C, with oxygen saturations

of 98%. Initially, meningitis or head injury sequelae were considered. Blood tests including cultures, empirical acyclovir, a CT head scan, intravenous antibiotics and a lumbar puncture were advised. Non-accidental injury (NAI) was deemed unlikely.

CT reported no evidence of intracranial injury, but a grossly abnormal retropharyngeal area suggesting abscess formation. ENT review advised urgent intraoral abscess drainage.

INVESTIGATIONS

Blood tests showed a white cell count of $32 \times 10^9/L$, a C-reactive protein of 273 mg/L and mildly elevated platelets of $434 \times 10^9/L$. Capillary blood gas found a mild alkalosis of 7.47 and a raised lactate of 1.3.

Head CT found a 3.4 cm $\times$ 1.5 cm $\times$ 2 cm trans-spatial abscess in nasopharyngeal and oropharyngeal regions. It extended in the prevertebral area superiorly to the clivus and inferiorly to the base of the second cervical vertebrae (figure 1). Airway was noted to be narrowed in the transverse plane at the level of the pharyngeal abnormality.

The central retropharyngeal component also spread laterally left, where infective changes extend superiorly to the skull base. This parapharyngeal

Figure 1 CT venogram in the sagittal plane. The RPA can be seen extending into the oropharynx. The patient has been intubated for theatre, with the endotracheal tube visible in the trachea. RPA, retropharyngeal abscess.

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Figure 2 CT venogram in the coronal plane. The abscess can be seen to have two locules, one centrally and one larger locule extending laterally left.

component had a 5 mm vascular enhancing nidus in the centre of the abscess, intimately related to a branch of the left external carotid artery. There was loss of fat plane between the abscess and the left carotid space, with the left internal carotid artery and external carotid artery branches passing close to the left lateral border of the abscess (figure 2). The left internal jugular vein was narrowed to very small calibre extending to the jugular bulb and displaced laterally.

CT venogram was negative for venous sinus thrombosis and subdural empyema.

DIFFERENTIAL DIAGNOSIS

At 11 months old, with non-specific symptoms presenting in the colder months, a meningitic episode was suggested, and a lumbar puncture and acyclovir course arranged. With the patient apyrexial, head injury sequelae such as nausea and a persistent headache explained a number of the symptoms and prompted CT head scan. With vomiting a viral gastroenteritis was also considered. When blood tests showed raised inflammatory markers and white cell counts, an infectious component was confirmed and empirical broad-spectrum antibiotics prescribed. With delayed presentation NAI was considered, but thought unlikely, with injuries appropriate for developmental age and consistent history.

TREATMENT

Patient had intraoral incision and complete RPA drainage. The cavity was cleaned and irrigated. Surgical team noted the palatine tonsils were swollen and erythematous and potentially aetiological. They performed bilateral tonsillectomy dissection with silk ties to ensure postsurgically airway patency and for subsequent episodes of tonsillar pathology. A nasogastric (NG) tube was placed. Postoperative management included paediatric high-

dependency unit admission, 3 days of intravenous dexamethasone, metronidazole and cefotaxime, 4 days intravenous paracetamol and NG feeding until achieving adequate oral intake.

With primary haemorrhage after emergency ('hot') tonsillectomy a concern, and with a leaking incision in the oropharynx, a definitive and protected airway was considered. However, with the infant breathing spontaneously and maintaining their own airway, it was deemed unnecessary.

The patient was deemed suitable for transfer to the ward day 2 postoperation. Oral intake improved by day 3, and the NG tube was removed.

OUTCOME AND FOLLOW-UP

After unremarkable postoperative period and significant clinical improvement after total 4 days in hospital, the patient was discharged with 10 days oral co-amoxiclav. As prognosis for complete recovery without sequelae is excellent in uncomplicated cases of RPA, no follow-up was arranged. His parents were educated on the clinical signs of deep space neck infections in case of recurrence and advised to re-present if elicited.

DISCUSSION

Admission rates for RPAs are increasing. From 1996 to 2011, admission rates rose 41% in England, coinciding with a 41% decrease in the number of tonsillectomies performed over the same period.² This rise in RPA cases is concerning as RPA complications have high mortality rates. Mortality in progression to mediastinitis is 40–50%, to carotid artery rupture it is 20–40%

Patient's perspective

- It started when he was playing with his older brother on Friday. He's walking but not steady on his feet yet, and he slipped and bumped his head on the metal bar of his highchair. We kept an eye on him for the next day or two, but after repeated visits to hospital with his brother doing similar things, we knew to look out for him being particularly sleepy or not eating, and he was his normal self on Monday and Tuesday. Wednesday a good going bruise had appeared where he had the bump, he slept poorly and was becoming out of sorts. We thought he might be teething. Calpol had little effect. Thursday he ate nothing, having only a bit of water all day and we almost brought him in that evening. Overnight he was again restless. We brought him in early Friday, worried that we should have come in sooner.
- The doctors took him for a scan of his head to check what might have happened when he fell. We heard someone say they had found something on the scan, I was anxious they meant injuries to his brain. Soon after we heard another doctor talking on the phone about an 11-month-old boy needing to go to theatre for an operation. The doctor came into our room after the phone conversation and explained what they had seen from the scan. We were still worried, but relieved it wasn't his brain. We didn't think a head scan would have gone far enough down to see any of his throat.
- They told us he had tonsillitis and that it had spread to the back wall of his throat. He had a ball of infection under the skin which they would drain. They hoped to be able to do it through his mouth, but might need to come in through the side of his neck. We were glad that they didn't need to.

Learning points

- ▶ RPAs are common in young children from 6 months to 6 years old. They are diagnostically challenging, particularly in infants, with potentially fatal sequelae from a variety of modalities if not identified and treated promptly. A high index of suspicion is advised.
- ▶ CT scanning is the gold standard for diagnosis. Optimal treatment requires broad-spectrum intravenous antibiotics and surgical drainage.
- ▶ Parapharyngeal abscesses and peritonsillar abscesses have similarly serious complications, however are commoner in older children and adolescents, respectively, meaning indicative symptoms such as neck stiffness, pharyngeal pain and odynophagia are more easily elucidated, facilitating diagnosis.
- ▶ Tonsillectomy numbers for recurrent tonsillitis are reducing due to more stringent referral criteria, leading to increases in the number of admissions for the complications of sore throats.
- ▶ Tonsillectomy is advised in severe RPA cases or in repeated admission with RPAs due to tonsillitis.

and to jugular vein thrombophlebitis (Lemierre's syndrome) mortality is around 60%.^{3 4}

The decline in tonsillectomies in the late 1990s has been reinforced by primary care trusts including tonsillectomy on 'procedure of low clinical effectiveness' lists as a 'relatively ineffective procedure' from 2005 and more recently by the adoption of the Scottish Intercollegiate Guidelines Network (SIGN) recommendations on tonsillectomies.⁵ This decline has coincided with increasing admission rates for tonsillitis, pharyngitis, peritonsillar abscesses and retropharyngeal and parapharyngeal abscesses.²

Attempts to limit tonsillectomies are driven partially by financial factors, with sore throats estimated to cost the NHS £100 million annually.⁶ Tonsillectomy remains an effective treatment for recurrent tonsillitis however, with many publications reporting improved patient quality of life from the procedure.^{7 8} Furthermore, with a 53% net increase in bed days for the complication rates of sore throats, much financial saving has been negated.²

The literature reports a small number of other cases of delayed RPA diagnosis in infants. These include a 6-month-old presenting stridulous and feverish. She was initially admitted for

croup, however progressing respiratory insufficiency prompted a CT scan and identified an RPA.⁹ A 13-month-old presenting with torticollis, stridor and dysphasia and aetiology initially uncertain was diagnosed with an RPA.¹⁰ In a third case, again after diagnostic delay, a mastoid abscess was found to be aetiological in a 9-month-old with RPA who presented with 1-week history of torticollis.¹¹ All these cases were treated with surgical drainage and postoperative intravenous antibiotics.

Having a high index of suspicion is particularly important in these infant cases. Around 75% of RPA cases are seen in patients under 6 years old, however in patients of older than 2–3 years the diagnosis can be expedited; patients complain of neck pain and odynophagia, the examination elicits trismus and drooling may be more unusual and thus more indicative. Diagnosis in patients in their first year is more challenging and can be delayed, risking dangerous sequelae.

Twitter Follow David Collis at @DHCollis

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