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Life-threating complication of parapharyngeal abscess and mediastinitis in a 10-year-old otherwise healthy girl following elective tonsillectomy – first reported paediatric case

C C Holm-Hansen[1], E Thisted[1] and M Kaltoft[2]

[1]Department of Paediatrics, Zealand University Hospital, Roskilde and [2]Department of Oto-rhino-laryngology – Head and Neck Surgery, Copenhagen University Hospital, Denmark

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Author for correspondence:
Dr Charlotte Carina Holm-Hansen, Juliane Marie Centre, 2nd Floor, Copenhagen University Hospital, Tagensvej 22, Copenhagen, Denmark
E-mail: Charlotte.carina.holm-hansen@regionh.dk

Abstract

Background. Parapharyngeal abscess and mediastinitis are rare but very severe post-operative complications following an elective tonsillectomy. Parapharyngeal abscess as a complication to tonsilectomy is very seldom described in the literature and no cases in the paediatric population have been described.

Case report. This paper presents, to our knowledge, the first case of life-threatening parapharyngeal abscess and mediastinitis following elective adenotonsillectomy in an otherwise healthy, fully vaccinated 10-year-old girl.

Conclusion. Diagnosing parapharyngeal abscess and mediastinitis can be challenging, but should be suspected and ruled out in cases of post-operative odynophagia, fever, and/or neck swelling and thoracic pain. Diagnosis is made based on magnetic resonance imaging and computed tomography findings. Prompt broad-spectrum intravenous antibiotic treatment and surgical drainage should be initiated. Other severe complications such as meningitis should also be considered.

Introduction

Elective tonsillectomy is one of the most frequently performed paediatric surgical procedures undertaken by otorhinolaryngologists. Approximately 100 million tonsillectomies have been performed in the last century since its introduction.[1] The most common indications for tonsillectomy in children are recurrent throat infections and tonsillar hypertrophy causing sleep apnoea or eating difficulties. Rarer indications include peritonsillar abscess, suspicion of malignancy and paediatric autoimmune neuropsychiatric disorder associated with streptococcal infection ('PANDAS'), among others.[1,2]

Complications such as pain and post-operative bleeding are well known, but severe complications are rarely reported.[2] Parapharyngeal abscess is a severe and extremely rare complication following elective tonsillectomy, and only a few cases in the adult population have been reported.[3–5]

We report a case of parapharyngeal abscess and mediastinitis in an otherwise healthy paediatric patient following elective tonsillectomy. To our knowledge, this is the first case of parapharyngeal abscess and mediastinitis in a paediatric patient.

Case report

A 10-year-old otherwise healthy, fully vaccinated girl attended Zealand University Hospital for out-patient elective tonsillectomy because of recurrent tonsillitis (treated with antibiotics), snoring and possible sleep apnoea. Blunt dissection tonsillectomy was performed after local anaesthesia. Haemostasis was achieved by bipolar diathermy. Adenotomy was performed during the same procedure. The patient was discharged the same afternoon. However, she was re-admitted the following day with complaints of thoracic pain, back pain and breathing difficulties.

An X-ray was performed and the findings interpreted as normal. A complete blood cell test showed a white blood cell count of 21×10^9/l, neutrophil count of 19.5×10^9/l and a C-reactive protein level of 109 mg/l. Intravenous penicillin and metronidazole were initiated in light of clinical suspicion of aspiration pneumonia.

Four hours later, the patient complained of severe neck pain, and had a single episode of vomiting and was found irritable on examination. Her temperature was 38.3°C and neck stiffness was present on examination, hence meningitis was suspected. She was transferred to the paediatric department to rule out meningitis. The antibiotics were changed to the standard first choice regime for meningitis; intravenous ampicillin and ceftriaxone and were continued for 5 days. At this point, she was referred to Copenhagen University Hospital for further investigation because of suspicion of a parapharyngeal abscess.

At Copenhagen University Hospital, a computed tomography (CT) scan was performed. The scan showed a retropharyngeal and parapharyngeal abscess in the right

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side measuring 1.9 × 3.3 × 6.3 cm, with relation to the right tonsillar area from the level of the second to the seventh cervical vertebrae. The abscess was medial to the carotid artery and jugular vein (Figure 1). In addition to the abscess, oedema and fluid were found in the upper mediastinum and into the pericardium.

The patient was put under general anaesthesia using a Boyle–Davis mouth gag. A prominence of the right side of the pharynx was evident. A wide incision was made and pus was drained. As the abscess seemed to be well drained, no external incision was made on the neck.

Video-assisted thoracoscopic surgery was performed using three ports. The mediastinum and pericardium were opened. Opaque fluid was seen here and irrigation was performed; two drains were installed. Because of swelling in the pharynx, the patient was kept intubated. She was admitted to the paediatric intensive care unit for continued monitoring and treatment.

A control scan was performed 2 days after surgery. This raised suspicion of a possible remaining small abscess. The patient was examined under general anaesthesia, but no abscess was found. Normal conditions were found in the larynx.

The next day, the patient was extubated without complications. She was transferred to the paediatric department, where she stayed for another 8 days for continuous antibiotic treatment.

Microbiological cultures from the pus found in the retropharyngeal abscess showed non-haemolytic streptococci, *Staphylococcus epidermidis* and *Neisseria subflava*. Cultures from the fluid in the mediastinum and pericardium did not show any bacteria. The patient was treated with intravenous meropenem, linezolid and metronidazole, in line with the microbiological findings.

On the 7th day, the drains were removed. On the 8th day, the patient was transferred back to the paediatric department at the local hospital, from where she was discharged.

Fig. 1. Axial computed tomography scan showing a retropharyngeal and parapharyngeal abscess in the right side measuring 1.9 × 3.3 × 6.3 cm.

Discussion

Parapharyngeal abscesses are seen regularly in ENT departments. The mean annual incidence in Denmark is reported to be 0.9 cases per 100 000 population. Parapharyngeal abscess is frequently associated with peritonsillar abscess.[6] Suggested aetiological factors for parapharyngeal abscesses are foreign bodies, second branchial pouch anomalies, a compromised immune system, and an altered balance between host defence and microbes.[3,5]

Parapharyngeal abscess is a very rare complication of elective tonsillectomy, with only a few adult cases reported and, to our knowledge, no paediatric cases.[3,5,7] In the cases reported in the literature, the symptoms have been odynophagia and fever, in addition to neck swelling, with more abundant swelling in the cases where the abscesses were located laterally to the carotid artery.[3,5]

Needle puncture during infiltration of local anaesthetics in tonsillectomy has been proposed as a route for the bacterial spread in some of the earlier cases reported, but there are also cases in which infiltrative local anaesthesia was not used. Larger studies reporting the effects of local anaesthesia in tonsillectomy have not reported severe infection as a risk. There are studies reporting both beneficial and limited effects of local anaesthesia.[8,9]

In our case, infiltrative local anaesthetics were used in the original elective tonsillectomy. These are used routinely for many tonsillectomies performed in Denmark and in the majority of tonsillectomies conducted in the Zealand University Hospital ENT Department. Although we cannot completely rule out that infiltration anaesthetics is a contributing factor to the development of a parapharyngeal abscess, it would of course not be the complete explanation. This case has not led to a change in the policy regarding the use of local anaesthesia in tonsillectomies.

Mediastinitis is an extremely rare complication of cervical infections, but it has been reported.[10,11] There are also only a few reports of mediastinitis as a complication of infection after elective tonsillectomy.[7] In our case, the patient had symptoms in the form of thoracic pain, and there were radiological and operative findings of mediastinitis, but no bacteria could be cultured. The fact that the patient had been treated with antibiotics before the thoracoscopy could explain why no bacteria were found in the culture.

There is a certain risk of delayed diagnosis in the case of parapharyngeal abscess as a complication of tonsillectomy, as the condition is very rare. Post-operative pain is the most common symptom after tonsillectomy, and parapharyngeal abscess is not the first complication that should be ruled out, but it should be kept in mind. Furthermore, diagnoses can be more challenging in children with more diffuse symptoms and a limited ability to describe these symptoms accurately.

- Elective tonsillectomy is one of the most frequently performed paediatric surgical procedures
- Parapharyngeal abscess and mediastinitis are seldom reported complications of tonsillectomy
- This is the first reported paediatric case of parapharyngeal abscess and mediastinitis following adenotonsillectomy
- The condition should be considered in children with neck swelling, odynophagia, severe neck pain or neck stiffness after tonsillectomy
- When suspected, computed tomography or magnetic resonance imaging should be performed, and surgery conducted when necessary

The suspicion of a parapharyngeal abscess with possible mediastinitis should be raised in cases of more severe neck

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pain and odynophagia, fever, neck stiffness and/or swelling, and respiratory difficulties. A magnetic resonance imaging (MRI) or CT scan should be performed immediately when the suspicion is raised; however, the side effects of diagnostic imaging in terms of radiation dose should always be considered. Furthermore, other severe complications such as meningitis should also be ruled out.

We report the first paediatric case, to our knowledge, of a parapharyngeal abscess and mediastinitis following elective adenotonsillectomy in an otherwise healthy 10-year-old girl. Parapharyngeal abscess is a very rare complication, but should be suspected in patients with odynophagia and fever, and/or swelling of the neck including thoracic pain. Diagnoses are made based on MRI or CT scan findings, and prompt treatment should be initiated. Treatment should consist of surgical drainage and intravenous antibiotics. The patient should be followed up post-operatively until no symptoms have been observed for a longer period of time. Furthermore, psychological consequences following critical illness should be screened for and treated accordingly. In this particular case, the patient suffered from anxiety, thoracic pain and alopecia for a longer period of time following the episode. The patient suffered from severe fear of death resulting in post-traumatic stress symptoms, for which she was treated by an experienced child psychologist, and with many consultations in the paediatric out-patient clinic.

Competing interests. None declared

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