CASE REPORT

Cerebral abscess following adenotonsillectomy: a rare complication

Ascesso cerebrale secondario ad adenotonsillectomia: una rara complicanza

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SUMMARY

In the present paper, we report an extremely rare case of a 4-year-old girl who developed a frontal lobe intracerebral abscess following adenotonsillectomy. This was diagnosed by computerised tomography at scan 21 days post-tonsillectomy when she presented with bilateral sixth nerve palsies. We believe that intracranial complications should be considered in any patient who present with headache or vomiting following tonsil surgery, especially if the patient has a spiking pyrexia.

KEY WORDS: Adenotonsillectomy • Cerebral abscess • Complication

RIASSUNTO

Nel presente lavoro, riportiamo il caso estremamente raro, di una bambina di 4 anni, la quale a seguito di un intervento di adenotonsillectomia ha sviluppato un ascesso intracerebrale del lobo frontale. Tale condizione è stata diagnosticata attraverso Tomografia Computerizzata (TC) eseguita dopo 21 giorni dall'intervento chirurgico, quando la paziente ha manifestato paralisi bilaterale del sesto nervo cranico. Riteniamo che la possibilità di una complicanza intracranica post-tonsillectomia debba essere presa in considerazione in caso di cefalea e vomito nel post-operatorio in particolare se associati a picchi febbrili.

PAROLE CHIAVE: *Adenotonsillectomia • Ascesso cerebrale • Complicanze*

Acta Otorhinolaryngol Ital 2011;31:253-255

Introduction

Approximately 52,000 tonsillectomies were performed in England according to the NHS in the years 2003/2004; despite a decline in the number of tonsillectomies, which in England has decreased by one third since 1995-1996, it still remains one of the most common surgical interventions [1]. Serious complications are rare, with haemorrhage being the most common cause of death. The National Prospective Tonsillectomy Audit carried out in 2003-2004 in England and Northern Ireland studied 40,514 operation records, and only one death was reported [2]. Intracranial complications are extremely rare, but have very serious implications. We report a frontal lobe intracerebral abscess that occurred 21 days following a tonsillectomy.

Case report

A four-year-old girl underwent adenotonsillectomy for obstructive sleep apnoea. There was no history of recent tonsillitis. Postoperative recovery was uneventful, no antibiotics were given pre- or post-operatively and she was routinely discharged the following day.

She presented 9 days post-operatively with general malaise, reduced oral intake, sore throat, dehydration and vomiting. Her temperature on admission was 37.8ºC. Clinical examination, including neurological assessment, was normal. A few spots of white exudate were visible in the left tonsillar fossa. There was no history of haemorrhage. Her white cell count (WCC) was 15×10^9/l and C-reactive protein (CRP) was 30 mg/l. During the first night, her temperature varied between 37.7 and 38.5ºC. Following 24 hours of intravenous antibiotics and fluids, her temperature returned to normal and she was clinically satisfactory. She was observed for a further 48 hours on a normal diet and oral antibiotics (Co-amoxiclav) and had apparently made full recovery. She was discharged with oral antibiotics for a presumed post-tonsillectomy infection.

Twenty-two days after the intervention she was again readmitted with general irritability, headaches and vomiting. She was noted to have lost 2 kilograms in weight since her tonsillectomy, and was spiking temperatures up to 38.5ºC. Examination of the nervous system was normal, apart from new bilateral sixth nerve palsies. Her in-

Fig. 1. CT scan at 21 days post-tonsillectomy showing a 6 cm solitary cerebral abscess within the posterior aspect of her left frontal lobe with an associated mass effect.

flammatory markers now showed a WCC of 21.8 × 10^9/l and CRP of 180 mg/l.

An urgent CT scan showed a solitary 6 cm cerebral abscess within the posterior aspect of her left frontal lobe with an associated mass effect (Fig. 1).

She was immediately transferred to a neurosurgical unit and 60 ml was aspirated stereotactically, but it recollected and a further 30 ml was similarly drained 4 days later.

Microbiology grew *Bacteroids* and non-haemolytic streptococci. Following microbiology advice, she was treated with two weeks of intravenous cefotaxime and metronidazole and then a further four-week course of oral cefixime.

Follow-up CT scans done at 19 days and 8 weeks following her second aspiration, confirmed no fluid re-collection. She made a good recovery and clinical examination a year later revealed no residual deficits.

Discussion and review of the literature

Cerebral abscess is a recognised complication of tonsillitis [3], but cerebral abscess following tonsillectomy is virtually unheard of today. Indeed, it is so rare that clinicians may not consider it in the differential diagnosis of complications following tonsillectomy. This in turn may potentially lead to a delay in diagnosis.

In the UK, we believe there has only been one previously reported case of cerebral abscess arising as a complication of tonsillectomy. The patient had acute tonsillitis at the time of surgery and this was the indication for the operation. This case was reported as a post-mortem diagnosis in 1930 by Johnson in the "British Medical Journal" [4].

The most recent case of a post-tonsillectomy intracerebral abscess reported in the world literature was in 2006. This article was from Iran and the patient was successfully treated with a frontal craniotomy and broad spectrum antibiotics [5].

Multiple intracerebral abscesses have also been reported. In 1962, a case report from Russia documented a patient with multiple brain abscesses following tonsillectomy [6]. A similar patient was described in 1985 by Pilgramm et al. who reported on a patient in the German literature with multiple intracerebral abscesses following tonsillectomy. This patient received hyperbaric oxygen as part of their successful treatment regimen [7].

Because of advancing medical therapies, such as broad spectrum antibiotics, improved bacteriological identification and improved imaging techniques, the very high mortality rate in the 1930's appears to have been reduced (Table I).

The greatest number of intracranial complications occur as a result of infection extending by some route to the brain from the tonsillar fossa.

There are four possible routes for tonsillar infection to spread into the cranial cavity [5]:

Direct spread

This may occur either through intact bone of the skull base, erosions or congenital defects.

Arterial spread

This may be by direct invasion or if via the perivascular sheaths, indirect.

Venous routes

One notorious example of retrograde venous spread is

Table I. Review of world literature. Previous case reports of intracerebral abscess following tonsillectomy.

Author	Year	Recent preceding tonsillitis	Presentation of abscess following surgery	Number of intracerebral abscesses	Outcome
Johnson [4]	1930	5,5 weeks prior to operation	5 days	1 Right frontal lobe	Died
Cadbury et al. [8]	1930	Yes "chronic"	18 days	7	Died
Alexander et al. [9]	1947	No	15 days	1 Frontal lobe	Died
Bischoff [10]	1951	-	-	1	Died
Gladkii [11]	1958	No	10 days	3 Frontal lobe	Survived*
Berdichevskii [6]	1962	Yes "chronic"	7 days	1	Died
Pilgramm [7]	1985	-	-	Multiple	Survived
Taghipour et al. [5]	2006	Not stated	18 days	1 Frontal lobe	Survived**

** Patient noted to have papilloedema with a raised white cell count and erythrocyte sedimentation rate. A left frontal burr hole was performed and the diagnosis was confirmed;*
*** 25-year-old male successfully treated with craniotomy and broad spectrum antibiotics.*

Lemierre's syndrome, in which spread occurs from the internal jugular vein.

Via perineural sheaths of the extracranial nerves

Contamination from whatever source, of the friable vascular tissue, coupled with surgical trauma provide an ideal environment in which infections can cultivate. It is perhaps surprising, therefore, that infections do not occur more frequently.

Review of the world literature for intracranial complications found reports following tonsillectomy to be extremely rare (Table I).

In 1942, Hara and Courville were one of the first to recognise that cerebral abscesses can occur as a complication solely from an acute tonsillar infection [12]. Witchell reported a patient with a retropharyngeal abscess following acute tonsillitis who, in addition, went on to develop four cerebral abscesses [13]. A case of cerebral abscess has even been reported secondary to implantation via a local anaesthetic needle injection of novocaine into the paratonsillar space [14].

In summary, cerebral abscesses have been recognised in the literature to occur following paratonsillar injections, acute tonsillitis and surgery to the tonsils, but are extremely rare.

Conclusions

Over 50,000 tonsillectomies are performed in England as reported by the NHS each year. Deaths are fortunately rare. Intracranial complications should be considered in any patient who presents with a headache or vomiting following tonsil surgery or acute tonsillitis, particularly if the patient has a spiking pyrexia. Rare diagnoses should be considered in any patient who presents to the clinician with an atypical history.

Acknowledgements

We would like to thank Dr. Hector Arthur for his help in translating the Russian reference articles.

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Received: April 12, 2010 - Accepted: March 20, 2011

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