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Radiology in Focus

Unusual complication of parotid abscess

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Abstract
Temporal lobe abscess as a complication of parotid abscess is not described in the English literature. In this case report a 66-year-old gentleman is described who presented with a left-sided parotid abscess, which extended to other deep neck spaces, and advanced to develop a temporal lobe abscess and subdural parietal empyema. Treatment included intravenous antibiotics, incision and drainage of parotid abscess, and burr hole aspiration of the temporal lobe abscess. The importance of imaging to evaluate the extent of deep neck abscess and brain abscess is highlighted in this report.

Key words: Parotid Gland; Neck; Abscess; Temporal lobe

Introduction

The parotid space is one of the important spaces of the deep neck region. Intracranial complications of a deep neck abscess are well recognized but rare in this post-antibiotic period. The complexity and the location of deep neck spaces make diagnosis and treatment of infections in this area difficult. Temporal lobe abscess constitutes 27 per cent of all intracranial abscesses,[1] and the commonest source of infection is otogenic. The incidence of intracranial abscess is approximately three per million per year and it carries a high rate of mortality of 20 per cent, and eight per cent remain disabled by it.[2] Computed tomography (CT) scans accurately identify the anatomical location of the deep neck abscess and the involvement of important surrounding structures allowing a more accurate planning of the surgical approach.[3] Elizabeth *et al.*[2] compared their study with Garfield's[1] 1969 series and found that there was considerable reduction in mortality from 40 per cent to 20 per cent in patients with intracranial abscess after the introduction of CT scan particularly in the group who presented with impairment in consciousness.

Case report

A 66-year-old male was referred with a two-week history of fever with chills, and a two-day history of swelling in the left parotid region. On examination he had pyrexia (39°C) with tachycardia, confusion (GCS of 14/15), tender swelling in the left parotid region that was not fluctuant, carious upper and lower molars on both sides, and a bead of pus extruding from the left parotid duct orifice. The left facial nerve was intact, and ENT examination was unremarkable. The clinical diagnosis was left acute suppurative parotitis.

A swab from the left parotid papilla and peripheral blood culture did not show any bacterial growth. The patient was started on i.v. cefuroxime and metronidazole.

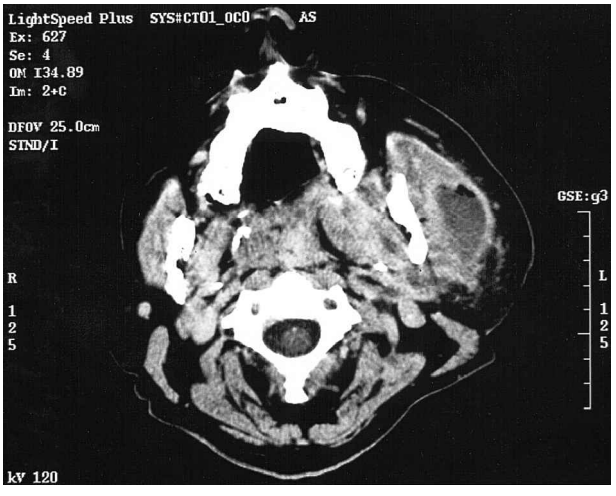

Fig. 1

Initial contrast-enhanced axial computed tomographic (CT) scan shows an area of low attenuation with an enhancing thick wall in the left parotid space consistent with an abscess.

CT scan of the neck and brain (Figure 1) showed a left parotid abscess, and also revealed its extension into the left masticator space, and signs suggestive of cerebritis in the left temporal lobe (Figure 2). Surgical drainage of the parotid abscess was performed and a drain was left *in situ.* There was a considerable amount of discharge from the drain for the next three days, and the swelling in the left parotid region gradually subsided. Although he was apyrexial, the patient became more confused and dysphasic thereafter. Serial CT scans (Figure 3 (a), (b)) of the

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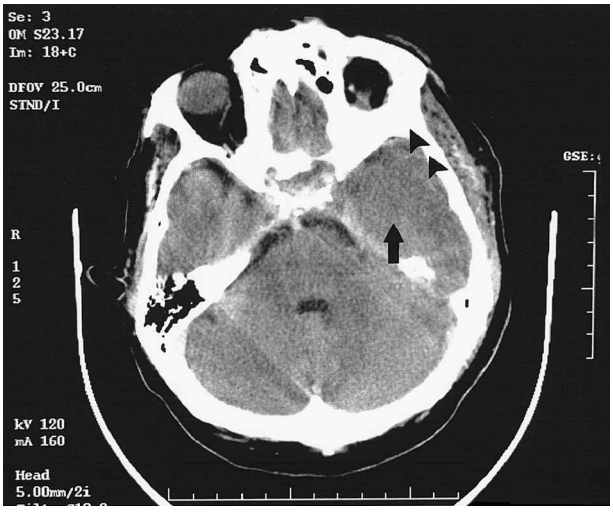


FIG. 2

On this earliest CT scan of the base of the skull there is an area of low density in the left temporal lobe with effacement of the sulci due to oedema of early cerebritis.

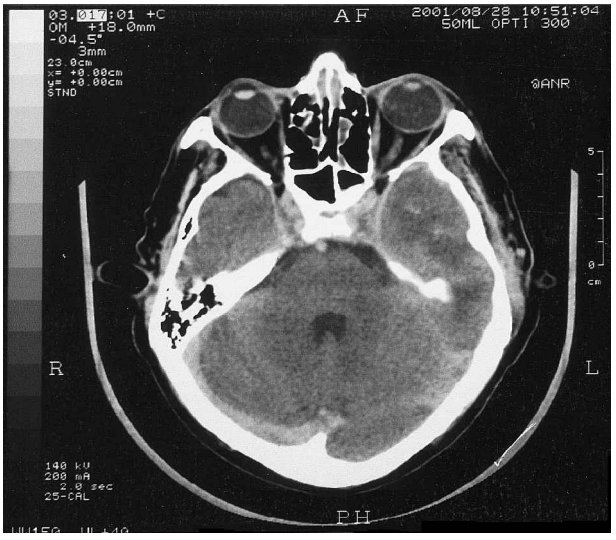
brain showed that the oedema had spread to involve the whole of the left temporal lobe, partially effacing the posterior horn of the left lateral ventricle.

He was then transferred to a neurosurgical unit. Further CT scans of the brain (Figure 4) revealed left temporal lobe abscess and subdural empyema. Burr hole aspiration of the temporal lobe abscess was performed and the pus aspirated was found to be sterile on culture. Scans after drainage displayed the process of resolution of the abscess cavity (Figure 5). The patient gradually recovered with no focal neurological deficit except for dysphasia, and was discharged home a month from the date of admission. At four weeks review he had made a complete recovery.

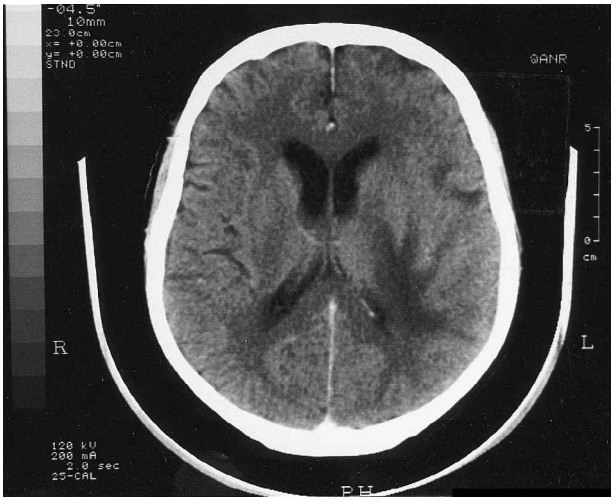
Discussion

The parotid space is one of the 11 spaces of the deep neck region. A calculus obstructing the parotid duct, acutely diminished flow of saliva, increased susceptibility to infection, and poor oral hygiene[4] may predispose to acute suppurative parotitis. The partial absence of a definite fascial barrier on the deep aspect of the parotid gland enables parotid suppuration to spread to the parapharyngeal space, and this space provides a central connection for all the other deep neck spaces and the skull base. The infection from the deep neck spaces can spread to the brain as a contiguous infection or by haematogenous dissemination.

Parotitis can present as swelling of the face and neck, and as an intraoral swelling. Transient complete facial nerve paralysis as a result of a parotid abscess has been reported.[5] The most common cause of deep neck abscess in the post-antibiotic era is dental infection (43 per cent), followed by intravenous drug abuse (12 per cent), whereas pharyngotonsillitis was the major contributor in the pre-antibiotic era.[6] Diabetes mellitus is the most commonly associated systemic disease. *Staphylococcus aureus* is the most common organism that causes acute suppurative parotitis.[7] Orthopantomography (if a dental source is suspected) and CT scans with contrast are the criterion standard in evaluation of deep neck infections. CT scan with contrast has 95 per cent sensitivity and 53 per cent



(a)



(b)

FIG. 3 (a), (b)

Ten days after initial scan, oedema has spread to involve the whole of the left temporal lobe partially effacing the posterior horn of the left lateral ventricle.

specificity in identifying deep neck abscess, and combined with clinical examination findings has a sensitivity of 95 per cent and specificity of 85 per cent.[8]

Airway management takes priority in any patient with deep neck abscess. Conventional surgical treatment of parotid abscess involves incising the parotid parenchyma in the direction of the facial nerve until the abscess is located and evacuated. Ultrasound-assisted percutaneous needle drainage of parotid abscess has also been advocated and its advantages over conventional surgical technique is well documented.[9] Sump catheter drainage of a parotid abscess as an alternative to surgery has been tried.[10] Most deep neck space abscesses require a transcervical approach to facilitate adequate exposure of the abscess and for protection of the surrounding neurovascular structures.

The source of infection for intracranial abscess is frequently apparent, although the definitive cause remains obscure in 10–37 per cent[11] of patients and according to

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FIG. 4

CT scan of the brain 18 days after presentation, an obvious left temporal lobe cerebral abscess has now developed and is ready for drainage.

- **This is a case report of a parotid abscess that spread to the neck and to the temporal lobe**
- **The authors emphasize that imaging is important if complications are to be adequately staged**

Garfield's[1] 1969 series it was otorhinolaryngological in 59 per cent, thoracic in 12 per cent, unknown in 19 per cent and other causes in 10 per cent of cases. CT scan remains the investigation of choice in diagnosing intracranial abscesses, and allows early diagnosis and accurate localization in addition to staging of the abscess according to the criteria developed by Britt and Enzmann.[12] Staging of the abscess allows the appropriate time of surgical intervention in the form of either aspiration or excision. Lately magnetic resonance imaging (MRI) has gained widespread use as a useful imaging modality, but there is a likelihood of the causal parotid calculus being missed. Treatment of brain abscess varies from i.v. antibiotics alone to surgical intervention in the form of aspiration through burr holes or excision of the abscess, or combination of these. Despite the significant reduction in mortality, brain abscess remains a serious illness that can result in death if misdiagnosed or not managed adequately. Even successfully treated brain abscesses can result in long-term neurological sequelae and disability.

In summary, parotid and other deep neck space abscesses should be investigated and managed aggressively. CT scan of the deep neck space accurately identifies the anatomical location of the abscess and the involvement of important surrounding structures, allowing a more accurate planning of the surgical approach. CT scan of the brain allows staging of the brain abscess and the appropriate time for surgical intervention, but early intracranial lesions are better visualized by MRI. The CT scan in our patient assisted in making a correct diagnosis of these two conditions and guided us to treat them appropriately.

FIG. 5

Scans after drainage show post-surgical changes in the left temporal lobe.

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