

# Gradenigo's syndrome

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## Abstract

**Gradenigo's syndrome, which is characterised by the triad of suppurative otitis media, pain in the distribution of the trigeminal nerve, and abducens nerve palsy may give rise to potentially fatal complications. Knowledge of the aetiology and appropriate investigations can lead to early diagnosis. A case is reported which illustrates this.**

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## Definition

In 1907 Guiseppe Gradenigo described a symptom complex of suppurative otitis media, pain in the distribution of the trigeminal nerve, and abducens nerve palsy (box 1).<sup>1</sup> Since the advent of antibiotics the incidence of this potentially fatal condition has diminished, but occasional cases still occur. As the symptoms are subtle ones, the condition is often recognised late. Knowledge of the aetiology and appropriate investigations can lead to early diagnosis.

### Box 1: Diagnostic criteria of Gradenigo's syndrome

- Suppurative otitis media
- Pain in the distribution of the trigeminal nerve
- Abducens nerve palsy

### Box 2: Aetiology of Gradenigo's syndrome

- Apical petrositis secondary to suppurative otitis media
- Extradural inflammation at petrous apex involving: trigeminal ganglion and abducens nerve

### Box 3: Possible sequelae of Gradenigo's syndrome

- Meningitis
- Intracranial abscess
- Spread to skull base and involvement of IX, X, XI cranial nerves (Vernet's syndrome)
- Prevertebral/parapharyngeal abscess
- Spread to sympathetic plexus around carotid sheath

## Aetiology

In patients with suppurative otitis media infection may spread to the petrous apex of the temporal bone, giving rise to apical petrositis. The spread of infection may be via pneumatised air cell tracts, through vascular channels, or as a result of direct extension through fascial planes.<sup>2</sup>

Close to the petrous apex, separated from it only by dura mater, lies the trigeminal ganglion. The abducens nerve lies medial and adjacent to the trigeminal ganglion. Extradural inflammation secondary to apical petrositis may affect the above structures and give rise to the symptoms of Gradenigo's syndrome (box 2). Further spread of infection may give rise to other complications. These are summarised in box 3.

### Box 4: Case report

A 78 year old insulin dependent man with a history of chronic suppurative otitis media presented with a facial nerve palsy and soon went on to develop further stigmata of Gradenigo's syndrome. The diagnosis was confirmed by magnetic resonance imaging (fig 1) which showed hyperintensity in the mastoid region. More accurate localisation, however, was obtained by a radioisotope bone scan which showed increased uptake in the petrous apex (fig 2). Despite the administration of high dose antibiotics the patient soon went on to develop stigmata of Vernet's syndrome (that is, involvement of IX, X, XI cranial nerves) followed by aspiration pneumonia.

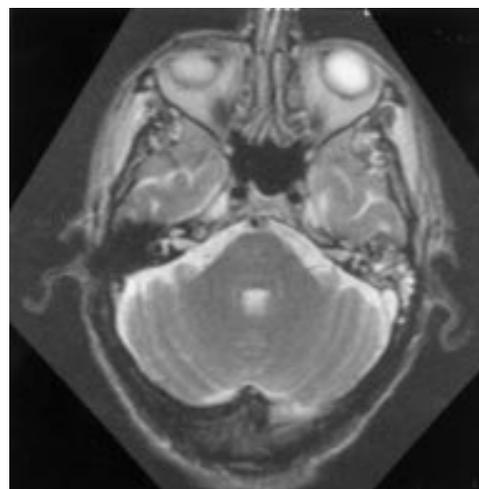


Figure 1 MRI showing hyperintensity in the left mastoid air cells and the middle ear.

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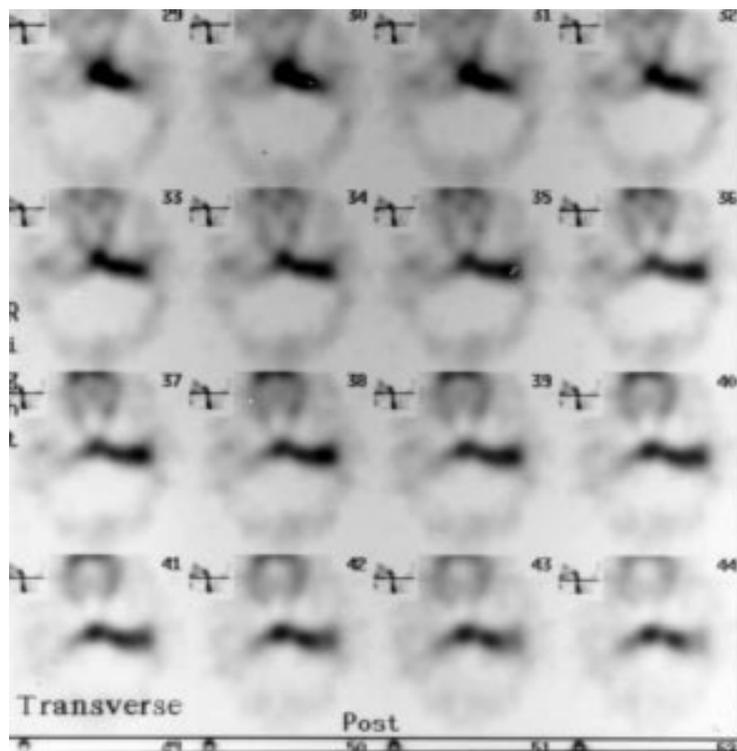


Figure 2 Radioisotope bone scan showing increased uptake in the left petrous apex.

#### Investigations

Investigations take the form of imaging the petrous temporal bone using different modalities. Computed tomography will show evidence of petromastoid air cell opacification, possibly

bone destruction, and is particularly helpful in diagnosing evidence of intracranial abscess formation.<sup>3</sup> Magnetic resonance imaging has been demonstrated to show the inflammatory changes in petrositis.<sup>4</sup> Radioisotope bone scan shows increased uptake in the petrous apex and hence aids localisation of the disease process.<sup>5</sup> Certain groups of patients are more susceptible to developing this condition: they include diabetics, those on high dose steroids, and immunosuppressed patients, including of course those with AIDS. All these therefore need to be investigated for.

#### Treatment

Awareness of the condition coupled with prompt investigations is required for early recognition. High dose antibiotic treatment, both systemic and topical, is the treatment of choice. This should be extended for long periods even if the patient appears to respond adequately to a short regimen. If the disease is recognised at a later stage then surgical drainage in the form of apical petrosectomy may be necessary.<sup>5</sup>

A typical case is described in box 4.

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