CASE REPORT

A 43-year-old woman presenting with subacute, bilateral, sequential facial nerve palsies, then developing pseudotumour cerebri

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SUMMARY

A patient presented elsewhere with what appeared to be a simple, unilateral, chronic suppurative otitis media and then developed an ipsilateral facial palsy. She soon developed the same problem on the other side. At the time, a brain MRI had been ordered but the clinician did not review it with a radiologist. The surgical specimens were not sent for histopathology. When transferred to our institution 3 months later, the patient had severe bilateral papilloedema due to intracranial hypertension due to missed cerebral venous sinus thrombosis. Further surgery revealed that the pathology in the temporal bone was B-cell lymphoma, which, fortunately, responded to chemoradiotherapy. There was good resolution of the facial palsies, but the patient has severe permanent visual loss due to optic atrophy.

BACKGROUND

Acute isolated unilateral facial palsy (Bell's palsy) is almost always idiopathic, self-limited and benign, requiring no investigation. In contrast, acute or subacute, simultaneous or sequential bilateral facial palsy is almost always serious, and needs detailed investigation and, usually, specific treatment. We report a patient who developed bilateral facial palsies that were mistakenly attributed to suppurative middle ear disease. The pathology was temporal bone lymphoma. The misdiagnosis could have been avoided had the clinician reviewed the MRI with a radiologist, and had tissue taken at mastoidectomy been sent for histopathology. Furthermore, the patient developed intracranial hypertension due to cerebral venous sinus thrombosis caused by the temporal bone disease. The intracranial hypertension was initially missed because the optic fundi were not examined. So although her lymphoma seems to have been cured and her facial palsies have improved, she now has permanent, severe visual loss due to post-papilloedema optic atrophy. We make simple recommendations for avoiding such egregious errors.

CASE PRESENTATION

On 4 February 2013, a previously well 43-year-old woman with a 2-month history of right ear pain, deafness and bloody discharge consulted a private otolaryngologist. The otoscopic findings were 'a friable vascular mass in the external auditory canal, obscuring the tympanic membrane, as well as mastoid tenderness'. A CT scan of the petrous temporal bones (figure 1) was reported as showing

'opacification of the right mastoid air cells with loss of bony trabeculae, and patchy opacification of the left mastoid air cells, without bone erosion'. A provisional diagnosis of right cholesteatoma was made and surgery was recommended.

On 20 February, a right modified radical mastoidectomy was performed. The operative note recorded the following findings: 'extensive granulation tissue filling the mastoid with erosion of the tegmen tympani, posterior external canal wall, and facial nerve canal at the second genu, findings

Figure 1 Axial CTs of the temporal bones taken on 20 February (A), 31 March (B) and 14 May (C). There is progressive soft tissue destruction of the mastoid air cells first on the right and then on the left. Last CT scan (C) showing soft tissue extension throughout the right temporal bone and overlying subcutaneous soft tissues, extending well beyond the recent surgical margins with destruction of the majority of the right ossicular chain, soft tissue abutting the tympanic and mastoid segments of the right facial nerve, and bony destruction over the inferior aspect of the right sigmoid sinus. Findings were less marked on the left, but also demonstrated soft tissue surrounding and occluding the left external auditory canal, early underlying temporal bone erosive change and opacification of left mastoid air cells and epitympanum.

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consistent with cholesteatoma'. Tissue was not sent for histopathology.

On 20 March, at the first postoperative visit, it was noted that the postauricular wound remained swollen and that there was persistent bloody discharge from the mastoid cavity. The patient also now reported diminished hearing from the left ear and a left serous middle ear effusion was aspirated. Topical soframycin and oral amoxicillin were prescribed.

On 31 March, she returned with right facial weakness. It was noted that the right postauricular region, external canal meatus and mastoid cavity remained diffusely swollen. Progress temporal bone CT scan (figure 1) was ordered and reported as now showing widespread destruction of the right mastoid air cells and complete opacification on the left, without trabecular destruction. She was prescribed oral dexamethasone, ticarcillin and ciprofloxacin hydrocortisone eardrops.

On 22 April, she returned with left facial weakness, hearing loss and ear fullness with a middle ear effusion. A grommet was inserted and she was instructed to use ciprofloxacin in both ears.

On 14 May, she returned with worsening left facial weakness. A further CT scan was ordered and reported as showing loss of

bony trabecular structure now on the left as well as the right. She was again treated with oral dexamethasone, ticarcillin and ciprofloxacin eardrops.

On 21 May, she returned with bilateral dense facial nerve palsies and bilateral conductive deafness. An MRI scan (figure 2) was ordered and reported to show postoperative changes on the right, and opacification of the mastoid air cell system on the left; there was no comment on any other abnormality. The patient was at this time referred to us. On arrival, she was found to have bilateral dense facial palsies. On the right there was a firm, non-tender postauricular swelling. The right meatoplasty was swollen almost to closure, and the mastoid cavity contained granulation tissue with bloody discharge. On the left, there was doughy, non-tender swelling over the mastoid and a bulging posterosuperior ear canal wall. The eardrum was intact; the grommet was patent without discharge. There was now a convergent strabismus due to abducens nerve palsy. The vision and the optic discs were not examined at this time. A temporal bone CT showed 'soft tissue extension throughout the right temporal bone and overlying subcutaneous soft tissues, extending well beyond the recent surgical margins with destruction of the majority of the right ossicular chain, soft tissue abutting the tympanic and mastoid segments of

Figure 2 MRI of the brain on 28 May (A and B) and on 21 May (C and D). Our MRI on 28 May showed bilateral postsurgical mastoid changes as well as enhancing soft tissue centred on the occipital falx, with early parenchymal extension involving the left occipital lobe (A – thick arrow). Soft tissue occluded the superior sagittal sinus at this location. Non-enhancing thrombus was also demonstrated more proximally within the superior sagittal sinus, and within both transverse sinuses and right sigmoid sinus (B – 2 thin arrows). The outside MRI from 21 May (C and D) was then reviewed by our radiologist, and this clearly showed that most of these changes were already present then: the posterior falx/occipital enhancing soft tissue and the extensive dural venous sinus thrombosis (all unreported), and the prominent bilateral enhancing soft tissue involving both temporal bones (D – 2 arrows; reported).

Figure 3 Fundus photographs taken on 27 May showing severe bilateral papilloedema with Humphrey visual fields showing marked peripheral field loss due to the papilloedema. An MRI the same day showing the papilloedema (long arrow), as well as a distended optic nerve sheath (short arrows)—suitable for fenestration surgery to protect the optic disc.

the right facial nerve canal and bony destruction over the inferior aspect of the right sigmoid sinus (figure 1). Findings were less marked on the left, but also showed soft tissue surrounding and occluding the left external auditory canal, early underlying temporal bone erosive change and opacification of left mastoid air cells and epitympanum'. Haematological testing and inflammatory markers were normal.

On 25 May, both mastoids were surgically explored. On the right, vascular granulation-type tissue filled the previously created mastoid cavity; it was debrided, but no anatomical features could be identified. The middle and posterior cranial fossa bony plates were eroded. In the left mastoid there was patchy destruction of the cortex, erosion of the posterior auditory canal wall with vascular, granulation tissue filling the mastoid air cells. Tissue was sent for histopathology. Neurology was consulted regarding the abducens nerve palsy. The neurologist noted that the patient's symptoms were those of the bilateral facial weakness, horizontal diplopia, and bilateral ear pain but no headache. On examination, apart from severe bilateral facial palsies and a right conductive hearing loss, the patient had bilateral abducens nerve palsies and severe bilateral papilloedema (figure 3). Visual acuity was RE 6/7.5 and LE 6/9. Visual field testing showed extensive bilateral peripheral constriction (figure 3). The neurological diagnosis was bilateral transverse sinus thrombosis causing pseudotumour cerebri or, what would have been once called 'otitic or otogenic hydrocephalus'.¹ A skull base and cerebral MRI (figure 2) showed bilateral postsurgical mastoid changes as well as enhancing soft tissue centred on the occipital falx with early parenchymal extension involving the left occipital lobe. Soft tissue occluded the superior sagittal

sinus at this location. Non-enhancing thrombus was demonstrated more proximally within the superior sagittal sinus, both transverse sinuses and the right sigmoid sinus. There was no hydrocephalus. The MRI films from 21 May were found (figure 2) and reviewed with a radiologist; they already showed the posterior falxine/left occipital enhancing soft tissue and extensive dural venous sinus thrombosis (all unreported) as well as enhancing soft tissue involving both temporal bones (reported).

INVESTIGATIONS

The biopsies from both mastoids showed non-Hodgkin's lymphoma diffusely infiltrating fibroadipose tissue, skeletal muscle and bone. The tumour was composed of infiltrative sheets of monotonous, intermediate-sized lymphoid cells with scanty cytoplasm and cleaved nuclei with inconspicuous nucleoli, high mitotic activity, apoptotic debris and necrosis (figure 4). The tumour cells were strongly and diffusely immunoreactive with CD20, CD79a (B-lymphocyte markers), BCL6 and CD10; they showed weak patchy immunoreactivity with BCL2 and lacked immunoreactivity with CD3, CD5 (T-lymphocyte markers), cyclin D1, TdT, cytokeratin (epithelial markers), desmin (myoid marker) and S100. They showed a Ki67 proliferation index of 95%. These features indicated non-Hodgkin's lymphoma, diffuse large B-cell type, with a high proliferative index. The tumour cells were negative for MYC gene rearrangement on fluorescence in situ hybridisation, excluding a diagnosis of Burkitt's lymphoma. A bone marrow biopsy showed no evidence of lymphoma, but positron emission tomography-CT showed hypermetabolism in the spleen.

Figure 4 Temporal bone mastoid biopsy. (A) Discohesive, atypical lymphoid cells diffusely infiltrating through skeletal muscle and adipose tissue (H&E ×40). (B) The tumour cells showing scanty cytoplasm and enlarged, hyperchromatic nuclei with irregular nuclear membrane. Scanty necrotic debris is seen in the background (H&E ×200). (C) The tumour cells are strongly and diffusely immunoreactive with CD20 (B-lymphocyte marker). (D) Immunostaining with Ki67 showing a proliferation index of 90–95% in the neoplastic cells.

TREATMENT

On 3 June, both optic nerve sheaths were urgently fenestrated, to salvage vision.² Intravenous unfractionated heparin was started to prevent extension of the cerebral venous thrombosis. The lymphoma was treated with radiotherapy and chemotherapy. The patient was given a total dose of 33 Gy to the occiput. She was then given six cycles of the hyper-CVAD regimen—cyclophosphamide, vincristine, adriamycin, dexamethasone and then methotrexate and cytarabine, both cytotoxic drugs that cross the blood–brain barrier, as well as three cycles of intrathecal methotrexate and dexamethasone. She had lumboperitoneal shunting to reduce intracranial pressure and bilateral tarsorrhaphies to protect the cornea.

OUTCOME AND FOLLOW-UP

At the time of writing, there has been bilateral improvement of facial nerve function to House grade I and recovery of abducens nerve function. The hearing has recovered to normal in the left ear, but there is a persistent conductive hearing loss in the right ear consistent with the mastoidectomy. Unfortunately, the patient has developed bilateral optic atrophy and visual fields remain severely constricted with acuities of 6/18 RE and 6/36 LE, 2 years after optic nerve sheath fenestration. The venous sinus occlusion improved but has not resolved completely. There has been complete remission of the lymphoma, so far.

DISCUSSION

The gradual evolution of facial nerve paralysis following surgery for chronic suppurative otitis media is inconsistent with a benign inflammatory disease. Bilateral hearing loss, non-tender mastoid swelling, external canal destruction and facial paralysis due to the initial chronic suppurative otitis media is unrecorded

in an immune competent adult with no previous history of ear disease. Abducens nerve palsy, developing in the setting of any ear disease, is an ominous sign, raising the suspicion of intracranial complications.

In this patient, the diagnosis of lymphoma could have been made 3 months earlier than it was, neurological complications avoided and treatment started, had tissue from the original mastoid surgery been sent for histopathology. Furthermore, misinterpretation and underestimation of the disease on the initial CT and MRI emphasise how important it is for the clinician ordering scans to review them with a radiologist so these can be interpreted in the correct clinical setting.

Bilateral facial nerve paralysis is rare, with an incidence of around 1 in 5 000 000 of the population. Unlike with cases of a unilateral facial palsy, Bell's palsy is the cause for bilateral facial palsy in only 20% of cases.³ Neurological causes that need to be considered include: Guillain-Barré syndrome, multiple idiopathic cranial neuropathy, myasthenia gravis, neoplastic meningitis and pontine tumour, as well as systemic inflammatory disease such as syphilis, HIV, sarcoidosis and granulomatosis with polyangiitis. So to miss the cause of one facial palsy could be considered a misfortune; to miss the cause of two, seems like carelessness.*

Exclusively extranodal disease represents 25–35% of all non-Hodgkin's lymphoma.⁴ Lymphomas constitute only 5% of all head and neck malignancies.⁵ Primary bone lymphoma

*With apologies to Lady Augusta Bracknell, a character in 'The Importance of being Earnest' by Oscar Wilde, son of Sir William Wilde, one of the originators of surgery for cholesteatoma and, for a time, Aurist and Oculist in Ireland, to H. M. Queen Victoria.¹²

Patient's perspective

"I have lost so much with this illness; my independence—I can't even get on a bus by myself anymore, my partner, my house, my sight and I wonder what next? If it was not for the love and care of my brother and 5 sisters and my adult son I could not have kept looking after my foster son, who means so much to me. I can't help thinking how much better things might have been had my disease been diagnosed sooner—but then I think, well, I am still alive." (Dictated by the patient, whose vision is too poor to read her own writing; transcribed by the corresponding author.)

accounts for 3–5% of extranodal lymphomas. Of 18 published cases of primary temporal bone lymphoma, only three presented with facial palsy—all unilateral;⁶ there are no reports of bilateral facial palsy. This case, despite its rarity, highlights the importance of recognising the otological and neurological presentation of extranodal lymphoma.

Lateral (ie, transverse) sinus thrombosis is a long-recognised complication of suppurative middle ear disease.⁷ Pseudotumour cerebri syndrome (ie, intracranial hypertension without tumour or hydrocephalus) is a long-recognised complication of sagittal sinus thrombosis, and even of unilateral transverse sinus throm-

bosis in patients with a hypoplastic contralateral transverse sinus.⁸ Papilloedema is not only the principal manifestation of intracranial hypertension, but, untreated, leads to optic atrophy and blindness.⁹ While papilloedema is usually easy to see on direct ophthalmoscopy, with the decrease in ophthalmoscopic skills of non-ophthalmologists, it is these days usually missed or not even sought.¹⁰ Fortunately, the optic fundi are easy to see on non-mydiatic fundus photography, a method that also provides a permanent digital record and is available from just about any suburban optometrist.¹¹ Perhaps it should be performed in all patients with active middle ear disease.

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Learning points

- Unlike acute unilateral facial palsy, subacute bilateral facial palsy is almost always due to some potentially serious disease.
- There is never a good reason for not reviewing images from a difficult case with a radiologist.
- There is never a good reason for not sending operative tissue for histopathology.
- There is never a good reason for not having the optic fundi examined and photographed in a patient needing middle ear surgery.
- Finally, if you are not getting on top of a progressive, subacute case, ask for help, early, as it is likely to turn out to be due to some serious disease.

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