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British Skull Base Society

Abstracts from meeting 16 April 1993

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The second meeting of the British Skull Base Society was held at The Royal Surrey County Hospital, Guildford and was attended by twenty seven members from as far afield as Edinburgh and Belfast.

High Resolution T_2 W Fast Spin Echo Interleaved Scans in the Investigation of Acoustic Neuroma

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Gadolinium enhanced T_1W MRI scans are now the accepted 'gold standard' for the diagnosis of acoustic neuroma, particularly in the exclusion of intracanalicular lesions. The recent acquisition of high resolution T_2W pulse sequences enables the acoustic nerve to be visualized from brain stem to end organ thereby reducing the need for gadolinium enhancement.

Fifty patients (all scanned on one day) had the new pulse sequence performed and the quality of the images were assessed independently by two radiologists. The results will be presented and show that this new pulse sequence dramatically reduces the requirement for gadolinium in the exclusion of acoustic neuroma, thereby having major effect on cost. The time taken for each scan is very short so that 50 patients can be easily examined in one day.

Bilateral Acoustic Neuromas

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This paper reviews the management of 12 patients with bilateral acoustic neuromas. The sex incidence was equal and the mean age at diagnosis was 26 years. Nine of the 12 had a positive family history. Five have had incomplete surgical removal of both sides. Of these, two are now totally deaf and three had severe sensorineural deafness in one ear and no hearing in the other. In five the tumour has been dealt with surgically on one side while the other side is being observed; there has been preservation of the hearing in the other ear, at least in the short term. The remaining two patients died of intracranial complications, one of them post-operatively. Four patients developed facial palsy immediately following surgery and one developed facial weakness six months later.

These tumours behave differently from unilateral neuromas and guidelines are suggested for discussion on the management of these patients. These include simple observation while the hearing is good, incomplete removal with decompression of the internal auditory meatus in the hope of delaying the hearing loss or total removal with the virtual certainty of total deafness in that ear, the selected option depending on the state of the hearing in each ear.

Subtotal Petrosectomy for CSF Leaks

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CSF leaks are the bane of both lateral and anterior skull base surgery. The subtotal petrosectomy with obliteration of the eustachian tube and blind sacking of the ear canal has been described in detail by Professor Ugo Fisch (1988), as a method of dealing with the CSF rhinorrhoea that occurs down the eustachian tube, either following trauma or surgical intervention on the lateral skull base.

The technique as described by Professor Fisch consists of: evaginating the transected ear canal to exterialize squamous epithelium and provide a two layered closure for the blind sacked ear canal; removal of the squamous epithelium from the ear canal; complete removal of the eardrum including annulus; removal of the ossicles after microsurgical division of the crura of the stapes; extensive removal of all mastoid air cells; removal of mucosa from the middle ear; drilling out the eustachian tube to its cartilaginous isthmus; closure of the eustachian tube with diathermy, bone wax, then packing with muscle, and obliteration of the cavity with free fat graft held in place with tissue glue.

We illustrate the technique with four typical cases operated on at Walton Hospital demonstrating the success of this technique in two patients post-translabyrinthine resection of acoustic neuroma and two post-traumatic patients with CSF leaks and recurrent meningitis.

Reference

Fisch, U., Mattox, D. (1988) *Microsurgery of the Skull Base* Thieme Medical Publishers Inc., New York.

Microanatomic Analysis of the Greater Auricular Nerve and its use as a Graft in Neurological Surgery

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Facial nerve repair following acoustic neuroma surgery

can be achieved by approximating the severed ends using sutures or tissue glue or by the interposition of an autogenous nerve graft (Fisch and Lanser, 1991). The greater auricular nerve is often used for such repairs although only limited studies of its microanatomy are available. A post-mortem study of the greater auricular nerve from six subjects assessed the length, size, cross-sectional diameter, fascicular cross-sectional area and numbers of fascicles at three separate points along its course. The parameters corresponded favourably with similar analysis in the facial nerve. Comparisons are made between the greater auricular nerve and the sural nerve (Brammer and Epker, 1988) and the morbidity of greater auricular nerve resection is discussed.

References

Brammer, J. P., Epker, B. N. (1988) Anatomic—histologic survey of the sural nerve. *Journal of Maxillo-Facial Surgery* **46:** 111–117.
Fisch, U., Lancer, M. J. (1991) Facial nerve grafting. *Otolaryngological Clinic of North America* **24:** 691–708.

Central Nervous System (CNS) and Skullbase Aspergillosis

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Fungal infections including those due to aspergillosis in neurosurgical practice are rare despite their possible inclusion in many differential diagnoses. Recently, these diseases have been diagnosed with increasing frequency, principally as opportunistic infections in patients undergoing treatment for a variety of primary diseases resulting in immune compromise. Epidemiology is problematical as mycoses are not notifiable diseases. At Atkinson Morley's Hospital we have recently been involved in the care of seven patients with aspergillosis (1988–1991), two with extensive skull base disease. Its presentation with abscess formation, granulomas, rhinocerebral form, meningitis, hydrocephalus and vascular involvement is varied. The majority of cases were seen in immunocompromised patients following haematogenous dissemination from a pulmonary or gastrointestinal focus. Direct spread from sinus infection has also been seen in otherwise healthy individuals. Diagnosis is problematical without the benefit of histopathological analysis. Prognosis is poor despite modern antifungal treatment, which in part reflects the primary underlying condition.

The Treatment of Recurrent Nasopharyngeal Carcinoma with Surgically Placed Afterloaded Interstitial Radiotherapy and Stereotactically Guided Fractionated External Beam Radiotherapy

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Nasopharyngeal carcinoma is usually responsive to external beam radiotherapy. Re-irradiation after recurrence is usually not possible. We describe our experience with four cases of recurrent nasopharyngeal tumours using interstitial radiotherapy with irridium, afterloaded into tubes placed surgically at the recurrence site; access having been achieved by way of maxillary osteotomy. In one case interstitial radiotherapy was supplemented by stereotactically guided fractionated external beam radiotherapy.

Intra-operative Smear Diagnosis in Skull Base Surgery

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Intra-operative smear preparation for rapid diagnosis of pathological processes is a long established technique in neurosurgical practice. Because of the lack of fibrous tissue in many Central Nervous System (CNS) tumours, a smear is easily prepared, thus avoiding the necessity of a cryostat and technical assistance needed for frozen section preparations. For the past four years, the technique has been used at Atkinson Morley's Hospital for material removed at the time of skull base surgery. Despite the frequent presence of fibrous tissue, it has been found possible to produce preparations that give diagnostic results in most cases. Identification of tumours, distinction between neoplastic and inflammatory processes and identification of normal tissues has been possible. The method, examples of skull base pathology identified and potential pitfalls are presented.

Intradural Chordoma – Report of Two Cases: Pathogenesis and Surgical Management

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Two patients with an intradural chordoma of the clivus are presented. Each patient had symptoms and signs of brain stem compression and cranial nerve palsies, but unlike the classical chordoma, the intradural variety is exceedingly rare and tends to be sharply circumscribed. A complete resection may be possible, but careful surgical planning is required in order to achieve this.

In each patient resection involved an anterior and a posterior approach. One patient had an initial transcondylar suboccipital excision followed 15 days later by a transoral-transmaxillary approach. This patient requires a further suboccipital transcondylar approach on the other side to complete the radical excision. The other patient had a LeFort I access osteotomy with a palatal split. This patient requires an additional approach to complete the excision.

We wish to discuss the pathogenesis of this intradural variant. Detailed multimodality pre-operative imaging is essential for surgical planning in order to obtain adequate access and optimal exposure of the lesion. Finally the advantages of a combined anterior and postero-lateral approach and the sequence of the planning is discussed.

Repeated Surgery Provides Good Palliation in Skull Base Chondrosarcoma

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Skull base chondrosarcomas are rare tumours which tend to present with symptoms due to the mass of the tumour itself or with cranial nerve palsies. Since they are locally invasive but rarely metastasize, local tumour control is essential for management of symptoms. Surgery remains the mainstay of treatment since other forms of therapy are of unproven benefit and satisfactory palliation of symptoms therefore requires a good operative exposure, which may need to be repeated with minimally increased morbidity.

Nine cases of skull base chondrosarcoma have been treated at Atkinson Morley's Hospital since 1985, using the LeFort I maxillotomy or mobilization of the zygoma at the time of frontotemporal craniotomy, to achieve clear, wide and repeatable exposure to the skull base. A total of 12 maxillotomies in seven patients, three frontozygomatic craniotomies in two patients and a combined suboccipital-subtemporal approach have been performed with two perioperative deaths, one case of CSF leak after a fifth maxillotomy and one patient required a tracheostomy for bulbar palsy. Symptoms attributable to the mass itself, such as proptosis and nasal obstruction, were well controlled and were amenable to improvement even after repeated procedures.

Overall, four patients have died a mean of 3.4 years after diagnosis, while four are alive with stable symptoms an average of 8.9 years after diagnosis. One patient was lost to follow-up with no evidence of disease at one year.

We believe that the LeFort I maxillotomy for midline tumours and the frontozygomatic craniotomy for more laterally placed tumours provides wide access to the skull base, allowing good local control of tumour. Both procedures can be repeated with minimally increased morbidity on multiple occasions producing satisfactory palliation of distressing symptoms for several years.