evidence of communication between cyst and fourth ventricle. The supratentorial ventricular system seemed to be normal. Computerised tomography and digital vertebral angiography were non-contributory.

A right retromastoid craniotomy was performed with the patient in the supine position and head turned to the left. After incision of the dura and cerebellar retraction, a large cystic mass with a thick wall appeared. The rostral pole reached the seventh and eighth cranial nerves. The caudal pole extended to the first cervical root. The ninth, 10th, and 11th cranial nerves were stretched downward. The cyst did not communicate with either the fourth ventricle or subarachnoid spaces. Incision of its wall immediately produced collapse of the cyst and relaxation of the nerves; the underlying brainstem seemed severely distorted. The cyst was opened into the subarachnoid space. The postoperative course was uneventful and CT within a few hours of operation showed significant reduction in the size of the cavity.

One year later, there was a significant improvement in the glosso-pharyngeal palsy and the disappearance of rhinolalia, and MRI showed resolution of the cyst (figure, right).

Histological examination showed the cyst wall to be composed of two distinct layers; the inner layer of neuroepithelial tissue and the outer of fibrous tissue. The luminal surface was lined by cubic cell epithelium of ependymal origin.

According to Morimura, our patient's cyst should be described as a glioneoplastic cyst thereby emphasising its developmental and heterotopic origin and its neuroepithelial nature. Three previous reports have described glioneoplastic cysts of the cerebellopontine angle cistern, two of which were symptomatic and were treated successfully by surgical marsupialisation or fenestration, keeping the wall in situ, as we have done for our patient, with good long term relief of symptoms.

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Double intraspinal enterogenous cysts

An enterogenous cyst in an intramedullary or intradural extramedullary location in the ventral cervicodorsal spinal canal may be a cause of spinal cord compression. Embryologically, the cyst derives from endodermal tissue displaced dorsally into the spinal canal ventral to the neural plaque through the interposed mesodermal layer that forms the vertebral bodies. Among 63 histologically verified cases of enterogenous cyst in the English literature, the case reported here is the only one that has been found with double cysts.

A 30 year old man presented with a history of weakness and atrophy of intrinsic muscles confined to his right hand for 15 years. He had neither history suggestive of poliomyelitis nor relevant sensory dysfunction before developing the present illness. The symptoms showed no progression until one year before admission when atrophy of his left hand and paraesthesia over his chest and right leg insidiously developed.

Needle electromyography showed chronic denervation over muscles innervated by C7-T1 roots with absent volitional activity over C8-T1 roots. The compound muscle action potential was absent over the right abductor pollicis brevis and abductor digiti minimi whereas sensory nerve coordination in his right arm was normal.

Lateral radiographs of the cervical spine showed widening of the anteroposterior diameter of the cervicothoracic junction. Magnetic resonance imaging of the cervical

Figure 1 Composite photographs of two MR images in axial view (right) and sagittal view in T1 weighted sequence (left). The spinal cord has been displaced posteriorly by two separate enterogenous cysts (arrows).

Figure 2 Composite photographs of sections from the cyst. (A) Histological appearance showing that the cyst wall is composed of connective tissue lined by a single layer of ciliated and non-ciliated columnar epithelium (haematoxylin and eosin, originally × 260). (B) Intracytoplasmic mucin can be identified in the epithelial cyst lining (diastase pretreated periodic acid Schiff reaction, originally × 165). (C) The cytoplasm responds positively to carcinomaembryonic antigen (CEA) staining (anti-CEA, originally × 220).
spine disclosed two intradural extramedullary masses located anterior to the spinal cord at the C7-T1 level displacing the cord posteriorly. These two masses had a high signal intensity compared with CSF on both T1 and T2 weighted sequences (Fig 1).

The patient was subjected to C6-T1 laminectomy. Before opening the dura, intraoperative sonography showed two separate cystic lesions. After severing the denticate ligaments, the spinal cord was retracted, exposing the cysts. The one behind the C7 vertebra was attached to the pia of the cord, was ovoid in shape, and partially invaginated into the cord. The second cyst, behind the T1 vertebra, was attached to the dura anteriorly and was pulsatile. It caused no obvious cord compression. These two cysts were extracted and excised from their attachments using an operating microscope.

The patient made an uneventful recovery. The paraplegia over his chest and right leg disappeared shortly after the operation, whereas weakness and atrophy of both his hands showed gradual but steady improvement during follow up to six months after the operation.

Each cyst measured 1-5 cm in diameter, had a light blue tint, and contained milky fluid. Histologically, both cyst walls were composed of connective tissue lined by a single layer of ciliated or non-ciliated columnar epithelium. Intracytoplasmic mucin was identified in some of the epithelial lining with alcian blue and mucicarmine, and was positive to a diastase pretreated periodic acid Schiff (DPAS) reaction. Carcinoembryonic antigen was demonstrated immunohistochemically in these cells (Fig 2). As the enteric tract is positive for this stain from the second to the sixth month of fetal development, Miyagi et al have reported that the epithelial cells of intraspinal enterogenous cysts respond positively to staining for carcinoembryonic antigen.1

Intraspinal enterogenous cysts usually affect young men more than women. They have been found more often in the cervical than in the thoracic or lumbar region. They usually occupy the intradural extra- medullary space.2 The initial clinical manifestations of our patient were weakness and atrophy of the intrinsic muscles of his right hand for 15 years without any sensory involvement, clinical features rarely seen in the previously documented cases. Woo and Sharr have subgrouped the cysts into two types—the developmental type usually located anterior to the cord in the cervical region and the teratomatous type usually located posterior to the cord around the conus.3

Intraoperative sonography showed not only the extent of cord compression, but also the coexistence of a second cyst, which might not have been easily seen during the operation especially when the cyst is anteriorly located and invaginated into the cord.


Cranioopharyngioma: early and long term recurrence after partial removal

There continues to be controversy over whether a cranioopharyngioma is best treated by total radical removal or by partial removal combined with evacuation of any cyst.1 There is a paucity of data documenting long term survival after 10 years. In this clinic 65 cases of cranioopharyngioma have been treated since 1950, by partial removal and cyst evacuation with no total removals. Twenty nine cases survived more than five years and the cause of death, time to recurrence, and use of further surgery and radiotherapy have been documented in those surviving for more than five years and less than 10 years. All cases were histologically verified. Ten cases died within the first year, either during the operation or in the early postoperative period. Twelve cases were lost to follow up and 14 cases with less than five years of follow up were excluded from this study.

There was a uniform surgical technique of puncture and aspiration of the cystic component followed by partial removal of the tumour capsule through a subfrontal approach on the right or non-dominant side. The capsule was removed as much as possible within the operative field, but traction of the capsule was not attempted, to avoid damage to the hypothalamic area. Hence, the capsule of the postero superior aspect where it attached to the hypothalamic surface was preserved. Visible tumour tissue was removed as much as possible, but hard or invisible tumour tissue was not removed intentionally. Calcification of the tumour was sometimes removed. When recurrence or enlargement of the residual tumour caused such neurological signs as increased intracranial pressure and visual deterioration, reoperation with or without radiotherapy or chemotherapy was performed if possible; in one patient, four times.

To investigate the proliferative potential of patients surviving for less than or more than 10 years, the silver colloidal staining method for nucleolar organiser regions (Ag-NORs) was used as it can be performed on fixed paraffin embedded sections.2 Briefly, the staining solution was prepared by dissolving gelatin in 1% aqueous formalic acid at a concentration of 2% and mixing with twice the volume of 50% aqueous silver nitrate solution. Paraffin sections (6 μm) were incubated in the staining solution at room temperature for 30 minutes in a dark room. The Ag-NORs were then counted under oil immersion at 1000-fold magnification. The NOR number was determined as the mean number of Ag-NORs per 200 tumour cells.

Tables 1 and 2 summarise the individual patient data of those surviving between five and 10 years and between 10 and 20 years, respectively.
Double intraspinal enterogenous cysts.

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