Extrinsic cerebral venous sinus obstruction resulting in intracranial hypertension

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Summary

We report the case of a 70-year-old man reporting with headache and visual disturbances who was being treated for prostate cancer. Investigations showed him to have intracranial hypertension caused by venous sinus obstruction. Patients with metastatic disease and raised intracranial pressure in the absence of focal signs should be considered as possible cases of venous outflow obstruction.

Keywords: intracranial hypertension; venous sinus thrombosis; malignancy

A 70-year-old man presented with a 1-month history of progressive generalised headache, worse in the morning and on straining, and a 1-week history of visual obscurations. He was otherwise well, although he was taking goserelin for carcinoma of the prostate, diagnosed in 1994 on the basis of a raised prostate-specific antigen and malignant-feeling prostate. On examination visual acuity was decreased to 6/24 in the right eye and 6/36 in the left eye. Both fundi were severely papilloedematous. The remainder of the neurological and general examination was normal.

Baseline haematology and biochemistry, including calcium levels, were normal. Erythrocyte sedimentation rate was 12 mm/h. Serum

immunoglobulins and electrophoresis were normal. Cranial computed tomography showed midline expansion and sclerosis of the occipital bone. Magnetic resonance imaging (MRI) confirmed midline occipital enlargement with loss of normal diploic marrow signal (figure 1). Axial images showed extrinsic compression of the superior sagittal sinus superior to the torcula (figure 2) which was confirmed on venous magnetic resonance angiography (MRA) (figure 3). A bone scan showed several metastases including the lesion in the occiput. He proceeded to have a lumbar puncture to confirm the clinical diagnosis of intracranial hypertension, to treat it by removal of cerebrospinal fluid (CSF), and to look for an underlying cause, such as malignant meningitis. The opening CSF pressure was 37 cm. The CSF was acellular with a protein content of 0.23 g/dl. He was treated with high-dose dexamethasone and repeated lumbar punctures prior to radiotherapy to his occiput. His visual acuity returned to 6/6 with resolution of his headaches. He subsequently developed further headaches and underwent surgery. The malignant deposit was peeled off the dura with visible re-expansion of the underlying venous sinus. Histology was very suggestive, but not diagnostic of a prostatic metastasis. The patient's headaches promptly resolved.

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Figure 1 Sagittal short TE/short TR (T1 weighted) MRI showing midline expansion of the occipital bone (arrows). The normal high signal intensity marrow within the diploic space has been replaced by low signal intensity tissue

Figure 2 Transaxial long TE/long TR (T2 weighted) MRI at the level of the occipital lobes. There is extrinsic compression of the superior sagittal sinus flow void (arrow) by the midline occipital bony expansion

Figure 3 Maximum intensity projection image from a coronally acquired 2-dimensional time-of-flight venous MRA sequence. The extrinsic compression of the superior sagittal sinus is confirmed (arrow). There is also absence of flow signal within the left transverse dural sinus (broad arrow)

Discussion

Idiopathic intracranial hypertension, as benign intracranial hypertension is now known, is believed to be due to a problem with CSF

resorption into the arachnoid granulations which project into the venous sinuses. It may be classified as primary or secondary. The primary cases may occur in association with a variety of medical conditions, such as hyperparathyroidism, or idiopathically. Secondary cases may be due to altered CSF composition such as high protein states, or due to interference with the venous outflow. The commonest cause of venous outflow obstruction is venous sinus thrombosis. These cases may present with headache and papilloedema in the absence of focal signs.¹ Much less well recognised is venous obstruction from extrinsic compression causing a similar syndrome.

Plant *et al*² presented two similar cases. In their first case a plasmacytoma was peeled off the dura at surgery resulting in visible re-expansion of the superior sagittal sinus. Their second case was of metastatic Ewing's sarcoma compressing the torcula. Other cases reported have included neuroblastomas, breast cancer and meningiomas.³⁻⁵ Gironell *et al*⁶ have recently reported midline occipital non-Hodgkin's lymphoma causing non-thrombotic superior sagittal sinus occlusion. The vast majority of cases have compression of the terminal superior sagittal sinus and torcula. There appears to be no particular vascular anatomical reason why metastases should concentrate here but more likely reflects the fact that metastases elsewhere in the skull are less likely to become symptomatic. Presumably this is because lesions here result in raised pressure along the entire length of the superior sagittal sinus. This would therefore affect the arachnoid granulations to the maximum extent. It is important to note the absence of focal signs in these patients.

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A non-contact complete knee dislocation with popliteal artery disruption, a rare martial arts injury

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Summary

Complete knee dislocation is a rare injury and an associated incidence of popliteal artery damage ranges from 16–60% of cases. It occurs commonly in road traffic accidents and in high velocity trauma where significant contact remains as the usual mode of injury. We describe a rare case of non-contact knee dislocation with popliteal artery injury sustained while practising Aikido, a type of martial art. This patient successfully underwent closed reduction of the knee with an emergency vein bypass graft. Similar injury in association with Aikido has not been described in the English literature previously. Various martial art injuries are briefly discussed and safety recommendations made.

Keywords: Aikido; knee dislocation; popliteal artery disruption; sports injury

'Martial arts' is a generic term encompassing a group of various fighting techniques that primarily use different body parts with or without weapons.¹ The main projected benefits of martial arts are self-defence, and increase of fitness, flexibility and self-esteem. A few of these special techniques include karate, kendo, Tae Kwon Do, kungfu and Aikido.¹ The term Aikido means the way (*do*) for the co-ordination or harmony (*ai*) of mental energy or spirit (*ki*). Morehei Uyeshiba, a Japanese master, founded Aikido nearly 50 years ago.² Martial arts in general are considered as a safe sport. However, there are reports of serious injuries including several deaths in the last few years.^{3,4} In this article we report a case of disabling knee injury associated with vascular compromise needing emergency limb revascularisation surgery.

Case report

A 20-year-old man was brought to the emergency room with alleged history of sustaining an accidental injury to his left knee while practising Aikido. He explained that he had lost his footing while carrying someone piggyback, and fell forward with his leg bent behind the body axis. On examination he had a complete left knee dislocation with anterior displacement of tibia and fibula. His left foot was cold and cyanosed without palpable pedal pulses. Closed reduction of the dislocated knee

Figure 1 Operative arteriogram showing total blockage of popliteal artery (arrow)

under general anaesthesia was carried out successfully. Detailed examination of the left knee revealed complete disruption of posterior capsule, anterior cruciate ligament, and posterior cruciate ligament and varus valgus instability. An intra-operative arteriogram revealed complete blockage of the popliteal artery (figure 1) with no filling of distal vessels. He underwent end-to-side anastomosis using a reversed saphenous vein bypass graft to join the distal superficial femoral artery and tibioperoneal trunk successfully. The limb was immobilised in flexion using a cast.

Postoperatively, the limb survived and he gradually recovered. A repeat arteriogram done 4 months later confirmed a well functioning graft with a good runoff (figure 2). He received rigorous physiotherapy and rehabilitation over a period of 10 months. His proprioception improved gradually to 100%, as did his motor function. Interestingly, he never experienced a feeling of instability throughout this period. He was doing well at follow-up after 16 months.

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