SOCIETY OF BRITISH NEUROLOGICAL SURGEONS

The THIRTIETH MEETING of the Society was held in London on Saturday, May 8th, 1943, at the National Hospital, Queen Square.

PROLONGED POST-TRAUMATIC AMNESIA
A. A. McCONNELL

Six patients who had sustained concussion and had become accessible continued in a state of amnesia for over five days. Exploratory operations were performed. In one case nothing abnormal was found; in five cases a definite subdural effusion ("subdural hydroma") was present. It was suggested that the subdural effusion had been a factor in the prolongation of the amnesia following concussion. The fluid accumulation was bilateral in two of the cases. The volume of the hydroma was as much as 200 c.c. in one case, and the protein content of the fluid was recorded as high as 3 per cent. Rapid improvement in symptoms following evacuation of the hydroma was evidence of its importance in maintaining disability.

BRIGADIER RIDDoch had been interested in cases of prolonged amnesia after head injuries. A similar state might follow severe hypoglycaemia and carbon monoxide poisoning. Eventually recovery might be complete or sequelae might persist. Similar states might follow cerebro-spinal meningitis and he had seen it in patients who, while showing no superficial evidence of injury, had been in air raid shelters which had received a direct hit. He felt that the previous personality of the individual might be important in the long amnesias.

COLONEL DAVIS (U.S.A.) had not seen the condition described by McCONNELL. He had experience only of cases exhibiting clinical and lumbar puncture, evidence of increased intracranial pressure. He felt that in the absence of pressure signs the surgical attitude should be conservative.

THE USE OF ACRYLIC RESIN PLATES FOR REPAIR OF SKULL DEFECTS
A. S. KERR

A few months ago MAJOR EDGAR KAHN of the U.S.A.M.C. told me that he had tried a new plastic material on the suggestion of EARL WALKER of Chicago. It is an acrylic resin closely allied to Perspex. I determined to try it and have already used it on seven cases.

It is far too early to make any final assessment but we believe, both from our own experience and from that of plastic surgeons, that it is absolutely innocuous to human tissues. It has adequate strength, is a non-conductor and bacteria cannot be grown on it. The material is sent from the dental manufacturers in the form of powder and liquid which are mixed and poured into a mould and then boiled for an hour and finally polished. It can be drilled for sutures and trimmed to size at the operating table; while a certain degree of moulding is possible if it is heated in a spirit lamp flame and held in the desired shape in the surgeon's hands for a few seconds while it cools.

The operation proved to be surprisingly easy and the convalescence in all cases has been uninterrupted except that in some cases a hematomata has developed between the skull and the resin plate and occasionally has required aspiration. The material is non-opaque to X-ray.

MAJOR KAHN felt that the substance was of great value in closing cranial defects. It was a simple technique and could be carried out much more quickly than a bone graft.

COLONEL LOYAL DAVIS stated that this substance could be prepared in many forms—Nylon, for example, was one. Weight for weight its strength compared favourably with that of steel.

MR. D. W. C. NORTHFIELD questioned whether the material had any advantage over a bone graft.

MR. HARVEY JACKSON pointed out that the celluloid plates used to close cranial defects in the last war were unsatisfactory and very frequently had to be removed at a subsequent operation.

MR. KERR stated that tissue reaction to the new material was quite different to that of celluloid.

CEPHALIC ANEURYSMAL FORMATION
NORMAN M. DOTT

A major portion of central nervous dysfunction is due to disease of the cerebral vasculature and cephalic aneurysmal formations are frequent. The intracranial aneurysm makes a strong appeal to the surgeon because of the minute flaw in an otherwise healthy body, the young life at stake and the mechanical nature of the lesion. The possibility of accurate localization of the lesion by stereoscopic angiography makes the appeal all the greater. Certain types of this vascular lesion would be considered separately.

1. The developmental saccular aneurysm associated with apoplexy.

This is the most common type. Some of these aneurysms are situated below the circle of Willis while others are on or above the circle. Exact localization of the lesion by stereoscopic angiography is necessary since those below the anastomotic circle are amenable to proximal ligation in the neck, while those at a higher level require local treatment.

In the case of the aneurysms below the circle carotid ligation is the treatment but is not without risk. The lesion in the cerebrum which follows the procedure is probably ischemic and shows itself between twelve and seventy-two hours after ligation. It may be due to vasospasm. The risk of such complications may be diminished by gradual obliteration of the lumen of the carotid artery over a period of three days by means of a specially made
screw clamp and then applying the ligature. If symptoms arise at any period the clamp can be loosened for a period. Good angiograms may enable one to estimate the risk of ischemic cerebral lesions following carotid ligation, e.g. by revealing compression of one of the main cerebral arteries by the aneurysmal sac or by demonstrating an imperfectly developed anastomotic circle.

Saccular aneurysms above the anastomotic circle present a different problem. Examples of this type had been dealt with—small ones by wrapping muscle around the sac; larger ones by opening the sac—after temporary occlusion of the main artery—and after packing it with muscle suturing the opening.

2. The developmental saccular aneurysm as an expanding lesion.

Most neurosurgeons had met the pituitary tumour which turned out to be an aneurysm. There were several such cases in this series. In addition there was a patient with evidence of involvement of the second, third, and fifth cranial nerves on the right side. An episode in the history suggested an aneurysm but a right arteriogram showed none, but revealed a mass compressing the right anterior cerebral artery. Exploration revealed an aneurysm. A subsequent left arteriogram revealed that it arose from the left internal carotid and leant across to compress the opposite optic nerve and anterior cerebral artery. Treatment here was a problem since the right anterior cerebral artery was filled from the left internal carotid. However, by progressive occlusion and ligation of the left internal carotid artery vision recovered well and the right anterior cerebral opened up satisfactorily.

3. Carotid cavernous aneurysmal varices.

These may be either spontaneous or traumatic and give rise to congestive protrusion of the eye and a bruit. In a number of his cases proximal ligation of the internal carotid artery alone had been successful but in some the artery had to be occluded distally to the sinus in addition by the application of a silver clip.

4. Cerebral arteriovenous aneurysmal varices or cirsoid aneurysms.

These are multiple congenital arteriovenous fistulae—usually in a group within the brain substance. Their symptoms are due to impaired venous drainage of the cerebral area involved. They may cause intracranial hypertension, but more usually cause localized fits or parietal phenomena. Occasionally bleeding occurs. They had been treated by X-radiation and carotid ligation without great benefit. By locating the feeding vessels by angiography it had been possible to occlude them and to excise the system of varices.

5. Congenital cirsoid aneurysms of the scalp.

This may produce intracranial circulatory disturbance. He had a patient who had had such a lesion since early childhood and who in adult life developed Jacksonian epilepsy. Angiography showed that the scalp varices were draining partly into the intracranial venous sinuses. All the enlarged scalp arteries were ligatured and the lesion subsequently extirpated by turning it forward in a large scalp flap and dissecting the varices out from its deep surface. There resulted cure of the deformity and epilepsy.

BRIGADIER CAIRNS congratulated Mr. Dott on his excellent contribution and inquired as to the technique of stereoscopic angiography. MR. McCONNELL felt that the stress laid on angiography was most important. These lesions could not be treated satisfactorily without it. In one case the introduction of thorotrast appeared to have induced thrombosis in the aneurysm and a spontaneous cure. MR. KNIGHT suggested that in cases where it might be dangerous to ligate the internal carotid artery a common carotid ligation might be of value by itself or as a preparation for internal carotid ligation.

MR. NORTHFIELD inquired as to the type of silver clip used when a carotid cavernous leak was being treated by distal occlusion. MAJOR SCARFF described the special technique employed by the N.Y.N.I. which enabled the obliteration of the internal carotid artery to be relieved at a moment’s notice. MR. NORMAN DOTT described the technique of stereoscopic angiography and stated that the ordinary size of silver clip had been found adequate to control the internal carotid artery.

BULBTRIGEMINAL TRACTOTOMY—A MODIFICATION IN THE TECHNIQUE OF OPERATION

W. SWEET

Experiences in the performance of this procedure in 11 cases were described as a consequence of which a method was evolved which secures essentially a total analgesia to pin prick over all areas of the skin and mucous membranes supplied by the trigeminal nerve. The method consists in deliberately extending the incision both ventrally and dorsally beyond the limits of the descending tract of the trigeminal nerve. The ventral level is assured by determining the presence of hypalgesia or analgesia on the contralateral side of the body as a consequence of damage to the spino-thalamic tract, and the dorsal extension by deliberately carrying the knife blade to within 1 mm. of the pia on the posterior surface of the medulla oblongata. It was found that an incision to a depth of 3 mm. sufficed to secure the necessary analgesia in all cases. The neurological sequelae following this extensive incision, although considerable, have virtually disappeared within 2–4 months of the time of operation. A complete report of the work is to be published.

MR. HARVEY JACKSON had done the operation in a few cases. Neurological sequelae such as ataxia of the arm and unsteadiness of gait had been slight. He thought that it was difficult to be sure of producing anaesthesia in the distribution of the third division of the trigeminal nerve by the procedure.

BRIGADIER RIDDOCH pointed to the importance of the sensory changes in thrombosis of the posterior inferior cerebellar artery as an indication of the anatomy of the descending root of the trigeminal and its nucleus. In such cases the upper part of the face was more commonly and more completely anaesthetic than the lower face. Further, at times, involvement of the opposite quinto-thalamic tract gave rise to anaesthesia on the opposite side of the face to that of the vascular lesion.

CAPTAIN ECKER, U.S.A., asked what was the effect of the operation on the corneal reflex.

DR. SWEET wondered about the possibility of cutting the quinto-thalamic tract and thus producing
anesthesia on the opposite side, but he had not been able to satisfy himself that it was surgically possible. In reply to questions on the point he was of opinion that the subjective disturbance following tractotomy was no less unpleasant than that which followed section of the sensory root of the trigeminal. Finally the corneal reflex was not lost—a speck of sulphanilamide powder being blinked off the cornea.

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**SPINAL EPIDURAL ABSCESS**

**MAJOR KEITH, R.C.A.M.C.**

Two cases of empyema of the spinal epidural space in children are reported, both due to staphylococcus aureus. The leading clinical feature was spinal rigidity and tenderness. One child was eighteen months old. The infection spread from a small abscess on the buttock. The empyema involved practically the whole of the epidural space. It was diagnosed by obtaining pus at multiple spinal punctures and drained by four openings through the laminae at different levels. The child developed no obvious paralysis of limbs or bladder and made an apparently complete recovery.

The second case was a twelve-year-old boy. The lesion was apparently blood borne from boils at the elbow to the epidural space. Sepsis extended in an irregular and nearly continuous chain of pus and granulation tissue from D.6 to L.5. The patient was treated by laminectomy over more than half of the area involved. Paralysis, which was nearly complete in the lower limbs, recovered over a few weeks and the patient eventually made an apparently complete recovery.

Both patients were treated fairly late in their illnesses with rather large doses of sulphathiazole. Attention is directed to the wide distribution of the suppurrative process. Mr. Kerr had recently had two cases of this type. He felt that the prognosis was bad. Major Kahn (U.S.A.) had seen at least ten such cases.

**PRESSURE Palsy of the lateral popliteal nerve in the paralysed limb**

**CAPTAIN W.S. LEWIN, R.A.M.C.**

Attention was drawn to the vulnerability of the lateral popliteal nerve as it winds around the neck of the fibula, how it may be damaged by the local pressure of splints and plaster. In cases of hemiplegia and paraplegia the wasting of the limbs and the attitude of the paralysed limb, lying everted with the outer side of the knee resting on the bed, were additional factors important in the incidence of this pressure palsy.

A combination of three methods (clinical examination, electro-myography and the sweating reaction) was used to demonstrate the existence of these lateral popliteal nerve palsies in limbs already paralysed. The electromyogram and the sweating test, however, gave proof of these peripheral palsies; the presence of fibrillation action potentials in the muscles concerned indicate a lower motor neurone denervation whilst the sweating test, in a peripheral nerve lesion, will map out a corresponding area of anhidrosis.

Five case records were described demonstrating the application of these methods. Three of the lateral popliteal nerve palsies recorded were due to faulty posture of the paralysed limb in bed, one followed the application of plaster back splints and one after prolonged pressure on the nerve enforced by lying on the hemiplegic side because of a coincident infection in the other leg. Four of the five cases came from overseas and they were all seen within a period of three months which implied that this complication was commoner than usually supposed. The importance of these cases lay in their prevention. In the Services where the paralysed patient may have to be transported long distances in splints of various kinds and in hard narrow beds or stretchers it was particularly important that medical attendants should be fully aware of this complication and prevent it; under these conditions, it was the wisest policy, where applicable, to bandage on lightly a large pad of cotton wool over the outer side of the knee.

**COSTO-CLAVICULAR COMPRESSION OF THE SUBCLAVIAN VESSELS**

G. WEDDELL and MAJOR M. FALCONER, R.A.M.C.

Three cases of vascular disturbance in the upper limb due to compression of the subclavian artery and vein between clavicle and first thoracic ribs were described. In one of these in which cervical ribs were demonstrated the subclavian artery was compressed at two places: (1) between the scalenus anterior muscle and the apex of the cervical rib, and (2) between the clavicle and first rib. In a fourth case, which showed neurological disturbances only, the subclavian vessels were not compressed, and relief was obtained by section of a fibrous band compressing C.8 and T.1 nerve roots without division of the scalenus anterior muscle. The existence of a costo-clavicular compression of the subclavian vessels can be recognized by observing the effect produced on the arterial pulses of the limb by postural manoeuvres of the shoulder girdle. Backward and downward bracing of the shoulders is the movement which obliterates the pulses most readily. Observations show that the subclavian vessels can be compressed by these forced manoeuvres in many normal subjects. Symptoms arise only when this compression is easily provoked, and if the compression is not relieved at an early stage features of obliterative arterial disease may supervene. Symptoms when present range from cold blue hands with a tendency to chilblains in the mildest group of cases, to "Raynaud attacks," arterial thromboses, and even gangrene in the more severe cases.

In the past these cases have been confused with those of the "scalenus anticus" syndrome. They may be differentiated by miralysing the scalenus anterior muscle with a local anaesthetic. In milder cases benefit may be obtained by remedial exercises designed to increase the postural tone in the muscles of the shoulder girdle. In the more severe cases operation is indicated, and is best commenced under local anaesthesia. The site of compression of the subclavian artery between clavicle and first rib is demonstrated by getting the patient to brace his shoulders backwards and downwards. In positive cases the tip of the forefinger is nipped between the clavicle and the rib and the radial pulse disappears. When a compression at this level is present, the essential part of the operative
procedure is removal of a segment of the offending rib from beneath the artery, for division of the scalenus anterior muscle alone may be ineffective.

MR. J. B. PENNYBACKER pointed out that while cases of the cervical rib syndrome were relatively rare in neurosurgical practice he believed that they were very common in general practice.

MR. NORMAN DOTT pointed out that costo-clavicular compression was largely due to defective muscle tone.

MAJOR J. SCARFF agreed with this and stated that many of the cases would respond well to physiotherapy alone.

MR. O'CONNELL was interested in that another explanation had been put forward to explain symptoms of cervical rib in the absence of abnormal rib. It was interesting too to note that in these cases abduction of the arm obliterated the pulse—the exact opposite to what is supposed to occur in a cervical rib. He had recently had such a case and relieved the circulatory disturbance by excising the anterior portion of the first rib.