SUB-DURAL ABSCESS OF THE LUMBAR CORD

Report of a Patient with Recurring Paraplegia

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THE literature on this condition is rather unrewarding. The last report of sub-dural pus that can be found was from Schiller and Shadle (1962), who discovered 'beads of pus' in the lumbar arachnoid in a woman from whom haemolytic streptococci were recovered in both the blood and cerebrospinal fluid. At operation they describe the matting together of the roots of the cauda equina. There was no paraplegia. This sounds rather reminiscent of meningitis. They could only find four previous publications totalling five cases and an extensive search of the Journals has not added to this. Indeed, of the two cases reported by Freedman and Alpers (1948), one should not be included, for at autopsy there was no abscess but a generalised softening of the cord associated with haematomyelia in a patient with pneumonia and pleural effusion. In their other case at operation, 'pus was seen to exude from a small abscess thought to be intramedullary'. At autopsy another abscess was found two segments higher up which measured 2 mm. across. Bennett and Keegan (1928) describe 'translucent granulation tissue' and 'a few beads of pus' beneath the dura. The cases discovered have been summarised for convenience in Table I. There is a high mortality rate and the *Staphylococcus aureus* has been isolated as the causative organism in several instances.

Doubt has been expressed about the existence of the sub-dural space as an anatomical entity; it certainly exists in the cranial meninges but is not distinguished in standard descriptions of the spinal cord. One has had the experience, however, of attempting ascending myelography soon after diagnostic spinal puncture and being distressed to see the contrast fluid flow along between the dura and arachnoid and eventually define the nerve root sleeves. This is presumably due to escape of cerebrospinal fluid into this potential space at the first procedure and the two layers of the membranes are stripped apart. On the other hand the term sub-dural may be a complete misnomer and the abscess may in fact be in the substance of the arachnoid membrane itself. Only section at autopsy would clarify this point.

It is felt that this condition is so uncommon that an account of this child should be reported. The patient is the infant son of a Gurkha soldier and at the time of the initial illness was aged 15 months (weight 23 lbs).

On Thursday, 28 May 1964, he was admitted to the sick quarters of his father's barracks with a running nose, cough and fever of 101.2°F. With general nursing care and aspirin he settled and was allowed to go home on the Saturday morning. On Sunday night he was returned with a temperature of 101.4°F. and was said by his mother to be unable to walk. He had been walking normally for the previous three months. The following day he was transferred to Singapore and admitted to the Paediatric unit.

The temperature on admission was 101.2°F., pulse rate 140 and respiration rate 22 per minute. The child was miserable and irritable with a flaccid paresis of both legs. Sensation to pin-prick was apparently absent below mid-thigh, but proximally produced a normal, indignant response. The knee and ankle jerks were absent in both legs and there was dribbling incontinence of urine. The anal

TABLE I
Summary of Reported Cases

Author	Age	Sex	Presentation	Level	Outcome
Abbott (1940), Los Angeles, U.S.A.	51	M	Case of meningo-vascular syphilis. Flaccid paralysis 8 days before admission.	D/L	Died of broncho-pneumonia and meningitis. Abscess discovered at autopsy.
Bennett and Keegan (1928), Omaha, U.S.A.	32	M	Pain, fever, leucocytosis and paraplegia for a month	D4/5	Recovered. Some loss of posterior column sense (<i>Staph. aureus</i>).
Chi (1936), Hunan, China	45	M	Pain, fever, leucocytosis and paraplegia. Abscess excised.	D10	Died 3 weeks later. No autopsy (<i>Staph. aureus</i>).
Freedman and Alpers (1948), Philadelphia, U.S.A.	36	M	Pneumonia and pain in back, weakness of left leg and bladder. Pyrexia.	D11	Died next day (<i>Staph. aureus</i>).
Present case (Singapore)	15 mths.	M	Pain, fever, leucocytosis and paraplegia	L4	Recovered. Walked. Disease recurred 3 months later. (<i>Staph. aureus</i>). Recovered again.

sphincter reflex was not elicited. When the child was sat up he at once propped his weight with his arms. Slight neck stiffness was recorded and there was uncertain tenderness of the lumbar spine.

Investigations. X-ray of the lumbar spine showed no bony abnormality. Haemoglobin 52 per cent. (7.8 g. per cent.). Total white cell count 23,000 per cu. mm. (Differential count, Polymorphs 73 per cent., Lymphocytes 24 per cent., Monocytes 1 per cent., Eosinophils 2 per cent.) A course of penicillin and streptomycin was begun and he was referred for orthopaedic opinion. A diagnosis of epidural abscess was accepted.

Operation was undertaken immediately. The spinous processes and laminae of the fourth and fifth lumbar segments were removed and the extradural space found to be normal. The dura was tense, bulging and not pulsating. It was incised and a large quantity (several cubic centimetres) of thick, creamy pus was released under considerable tension. With this came a semi-solid mass which at first was thought to be sequestered cord but which proved to be inspissated pus. The abscess cavity was sucked out. It was realised that no flow of cerebrospinal fluid had occurred, and that the neural elements were still enclosed in a membranous layer and granulation tissue. For fear of precipitating a more generalised

meningeal infection no further exploration was done. The dura was left open and the wound closed with a drain to the muscle layer.

The post-operative period was without incident. He went on to primary wound healing and convalescence. On the fifth day the antibiotic was changed to Tetracycline until the twelfth day. By this time the fever had entirely subsided. A transfusion (scalp vein) of 200 cc. of packed red cells was given on the fifth day which raised the haemoglobin to 83 per cent. (12.3 g. per cent.). Culture of the pus recovered grew a pure growth of a coagulase positive *Staphylococcus* (*Staphylococcus aureus*.)

Recovery in the left leg was noticed by the fourth post-operative day; the leg was withdrawn briskly on pricking the sole. He gradually moved this leg more and by the twelfth day this was quite vigorous. The right leg did not recover as well, but by the time he returned home on 26 June 1964 there was movement taking place at the right hip and he was progressing round his cot on all fours. The bowels were opening spontaneously and he was passing urine without bladder distension.

In retrospect the pre-operative diagnosis was quite proper on the basis of paraplegia with pyogenic infection. One could not expect to distinguish intrathecal abscess clinically. Apart from the upper respiratory tract infection the only possible contributory episode which could be elicited from the parents was the presence of a small furuncle over the lumbar region about one month prior to the illness, and the significance of this is uncertain.

The child was reviewed as an out-patient early in August and was then walking with minimal support. There was slight weakness of the right leg, but most encouraging improvement was obviously taking place.

On 4 September 1964 he was seen by another surgeon because of acute recurrence of the paraplegia associated with high fever, leucocytosis and spinal tenderness. He explored the back, encountering pus in the muscle layer in the midline. The cord itself was not exposed as drainage appeared to be adequate. The wound was closed and went on to primary healing accompanied by resolution of the systemic symptoms. The paraplegia did not recover.

He was referred back to the author on 21 September. Paralysis of both legs persisted, there was retention of urine—for which a catheter had been left in—and the bowel sphincter was affected. The child was listless and miserable and prognosis for the cord was thought to be hopeless.

On 28 September fever recurred with a leucocytosis of 20,000 per cu. mm. This was assumed to be due to yet another accumulation of pus. Osteomyelitis of the spine was considered but X-rays showed no disease. The urine grew *E. coli* but there was no blatant urinary infection.

For the third time the back was operated upon, but no pus was found. The cauda equina was explored after excision of the very dense scar tissue in which it had become enclosed. The nerve roots were matted by adhesions without any evidence of cerebrospinal fluid at this level. The possibility of recovery was dismissed and the wound was closed after incising both erector spinae muscles longitudinally in a fruitless search for pus.

Far from becoming more ill as one expected, the child improved and, having pulled out the catheter, was found to be passing urine spontaneously. The fever and leucocytosis resolved and remain unexplained. By the first week of October crawling was re-established and he was making feeble attempts to walk if supported. He was able to sit without using his hands. A month later he was once more stand-

ing and walking with support. There remained marked weakness of the right peroneal muscles for which a caliper was provided. The bladder was functioning normally and the urine was clear. In December we were alarmed to see him again with overflow incontinence of urine, fever and a leucocytosis of 27,500. Again X-rays showed no evidence of osteomyelitis. Although the original sepsis was clearly defined, it was thought probable that the recurrent sepsis was due to secondary bone involvement. On this occasion he was treated with methicillin and the symptoms subsided.

At present, he remains well but scarring and fibrosis around the nervous elements may, particularly with growth, induce progressive failure of conduction and late recurrence of paralysis cannot be discounted. The family are due shortly to return to Nepal and we may never be permitted to know what finally becomes of the child.

SUMMARY

A case of intrathecal, localised abscess of the lumbar region is recorded in which reasonable recovery was obtained after drainage by laminectomy and incision of the dura mater. This was followed by a second episode of paraplegia with sepsis which again recovered. A brief review of the literature and discussion of the pathology are included.

RÉSUMÉ

Le cas d'un abcès intra-rachidien localisé à la région lombaire est rapporté avec une amélioration raisonnable à la suite d'un drainage par laminectomie et incision de la dure-mère. Ceci a été suivi par un 2ème épisode de paraplégie avec infection, qui a de nouveau récupéré.

Une brève revue de la littérature et une discussion sur la pathologie sont incluses.

ZUSAMMENFASSUNG

Ein Fall eines lokalisierten subduralen Abszesses wird beschrieben, in dem zufriedenstellende Besserung durch Laminektomie, Eröffnung der Dura und Drainage erreicht wurde. Eine zweite Episode von Paraplegie mit Sepsis führte erneut zur Erholung. Die Pathogenese wird kurz erörtert und die einschlägige Literatur eingeführt.

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