PATHOLOGY IN THE EXTRADURAL SPACE

J. S. Crawford

SUMMARY

The case histories are reported of one patient who developed evidence of extradural infection 16 days postpartum, and another who spontaneously developed an extradural haematoma. Several points of interest and concern raised by these case histories are discussed.

This communication was prompted by two cases recently encountered in our medical centre. The first patient developed evidence of an extradural infection 16 days postpartum and had, it is presumed, developed a bacteraemia secondary to a high vaginal infection, with subsequent localization of the infection in an extradural haematoma. This patient had undergone a lumbar extradural block for labour, but had not been on anticoagulant therapy.

The second patient developed an extradural haematoma spontaneously 3 days postpartum. She had not received an extradural block, was not on anticoagulant therapy, and provided no evidence of a coagulation defect.

CASE REPORT NO. 1

The patient was a 31-yr-old multigravid whose first, uneventful pregnancy ended 2 yr previously when she underwent labour and delivery in this hospital under a successful and uncomplicated lumbar extradural block. The current pregnancy was essentially uneventful. She was admitted on November 26, 1973, for induction at term plus 3 days, but the membranes ruptured spontaneously at 02.00 hr on November 27. A lumbar extradural block was initiated at 03.45, by a competent and experienced anaesthetist. The block was successful and uneventful, labour was uncomplicated and at 14.55 the patient delivered spontaneously. The patient states, in retrospect, that she felt rather cold and shivered during labour, but she was apyrexial and did not have tachycardia. It may be noted here that our routine of skin preparation with iodine solution prior to initiation of a block was followed, and that all injections into the extradural space were made via a Millex filter attached to the extradural catheter.

The patient was well on the 2 days subsequent to delivery, but felt rather “feverish” on November 30, and during that day her temperature increased to 37.5 °C, and “spiked” intermittently during the subsequent 3 days, reaching 38.4 °C on occasions. She was nursed in our isolation ward, but antibiotics were not administered. There was no evidence of breast infection or urinary tract infection, and uterine involution appeared to be proceeding normally.

She was seen daily for 6 days by an anaesthetist on our routine post-extradural rounds. She had a mild headache on days 3 and 4, no backache and no disturbance of bladder function. She was discharged in a healthy state on December 4.

While in hospital, a high vaginal swab (HVS) was taken, and culture from this yielded a heavy growth of beta haemolytic streptococci (Lancefield Group B) which were “penicillin-sensitive”.

On December 12, 1973 (16 days postpartum), after feeling generally unwell for the previous few days, she developed severe pain in the back. Her general practitioner noted that she was pyrexial, had marked back stiffness with resultant immobility of her legs, and possibly exhibited meningitis. He was aware that she had had an extradural block for labour, and courteously and commendably asked us to see her. She was admitted (on December 14) to the Queen Elizabeth Hospital under the care of Professor O. L. Wade, as a case of suspected meningitis.

On admission she was found to be pyrexial (40 °C), and to have intense mid-back pain which caused severe limitation of leg movement. She had slight depression of the knee and ankle tendon reflexes on the right and was slightly tender in the lumbar region. It was decided that she did not exhibit meningism—the apparent neck stiffness was reflective of the intense spasm of the mid-lumbar region. She was found to have marked bladder...
PATHOLOGY IN THE EXTRADURAL SPACE

413
distension and was catheterized. Blood culture revealed the presence of beta-haemolytic streptococci, Lancefield Group B, which were indistinguishable from the organisms previously isolated from the HVS.

The pyrexia subsided following antibiotic therapy, but on the morning after admission (December 15) she still had considerable pain, with limitation of movement. Neurosurgical advice (Mr Eric Turner) had been sought earlier and it was now thought that she had developed an extradural abscess, and that surgical intervention was indicated. At operation (Mr N. K. Achari) the posterior laminae of L4 and part of those of L3 were removed. There was no evidence of superficial sepsis, and the probable track of the extradural needle and catheter had healed well. As the dura was approached, a small collection (1 cm in diameter) of watery, blood-stained fluid under considerable pressure was revealed and released. Exploration with a catheter revealed and released two additional, very small collections of similar fluid. Culture of these specimens provided no growth. Histological examination of the tissues removed at operation revealed no evidence of sepsis and no suggestion of abscess formation.

The postoperative course was not as uneventful as we had hoped. Although the local signs and symptoms referable to the involvement of the extradural space regressed satisfactorily, intermittent bouts of pyrexia, with occasional rigors, continued. All investigations designed to identify a causative organism proved fruitless, and the administration of a variety of antibiotics appeared not to influence the course of the disease. About 6 weeks after the birth, signs strongly suggestive of acute bacterial endocarditis developed (the patient has not previously suffered from heart disease), and eventually tricuspid incompetence was diagnosed. Shortly before this report was compiled the damaged valve was removed surgically. Although it was badly diseased, no organisms could be cultured from it. Her immediate postoperative course has been relatively satisfactory: she is receiving penicillin, streptomycin and cloxacillin and her temperature is, for the most part, normal.

CASE REPORT NO. 2

This patient was admitted in November, 1973 to the Neurosurgical Unit (Mr Eric Turner) of the Queen Elizabeth Hospital. She had been delivered (elsewhere in the Birmingham region) after an uneventful pregnancy and labour. Three days postpartum she suddenly developed severe pain in the back and legs, and on examination was found to have considerable weakness of both legs, with associated paraesthesia. She underwent laminectomy (Mr J. J. McMillan) and at operation she was discovered to have a haematoma of substantial size (2-3 cm diameter) in the extradural space at the level of T11-12. This was evacuated, and her recovery was complete and uneventful. This patient had not received an extradural block.

DISCUSSION

There are several points of interest and concern raised by these case histories. Firstly, spontaneously occurring haemorrhage into the extradural space is by no means a rarity. Markham, Lynge and Stahlman (1967) refer to 46 reported cases and add three from their own practice. Not infrequently it is associated with indirect trauma of an apparently trivial order. In a recent brief review, Lerner, Gutterman and Jenkins (1973) recall that the condition has been associated with local trauma (spinal or extradural puncture) in patients with blood dyscrasia, or those who are on anticoagulant therapy. However, it is our experience (and one which is, we believe, shared by most anaesthetists who practise lumbar extradural block) that quite frequently there is evidence that blood has been shed into the extradural space as a result of trauma by either the needle or the catheter during the initiation of a block. Our impression is that this haemorrhage rarely amounts to more than a few drops. We do not know whether or not a small quantity of blood was seen during insertion of the extradural implements in case 1, because we have not, until now, recorded the event; this omission in our recording system has now been rectified.

Extradural abscess is also a well-recognized entity. One which occurred in a postpartum patient (and said to be the first reported occurrence of this sequence) was detailed recently by Male and Martin (1973). Ten days before delivery, the patient had been jaundiced as a result of infective hepatitis and an extradural abscess developed spontaneously, becoming manifest on the 6th postpartum day.

One of the most authoritative reviews of this subject is that by Hulme and Dott (1954). They referred to 245 cases reported in the literature between 1926 and 1948, and added 25 cases from their own experience. The points raised by these authors are
particularly pertinent to the present discussion. Extradural abscess results most commonly from haematogenous spread of infection, usually from septic lesions of the skin or subcutaneous tissues, "but respiratory and urinary tract infections are among many other possible sources of organisms." “Trauma to the spine seems to play a definite precipitating part in a number of instances, perhaps by producing a haematoma in which organisms may readily multiply.” The clinical condition is characterized by the rapid onset of fever and malaise, accompanied by back pain (“often agonizing”) at the level of the site of infection. The pain is increased by movement (especially flexion as opposed to extension). Tenderness (to percussion or to pressure) is an important localizing sign. Headache is a common accompaniment. From the onset of the manifestation of the disease there is a polymorphonuclear leucocytosis and often a positive blood culture may be obtained.

Root pain develops, sometimes 1 day, usually 2–3 days, after the onset of the attack, and if therapy is withheld, impaired spinal cord function develops a few days later. Hulme and Dott emphasized the urgent requirement for surgical intervention and antibiotic therapy. “The prognosis bears a close relationship to the severity of the neurological impairment at the time of operation”.

It is worth emphasizing, as an addendum to the above, that the excruciating pain can apparently be caused by the presence of a very small collection of fluid under tension, as occurred in our first patient.

Thus we have two factors for consideration: (a) haemorrhage into the extradural space is not frequently induced during the initiation of a block; and (b) a haematoma in the extradural space can provide a locus for blood-borne infection (as undoubtedly happened in case 1). What action, if any, does this indicate? The extreme rarity of the syndrome exemplified by case 1 suggests strongly that there is no cause for alarm. The association between a vaginal infection with the usually non-pathogenic organism, beta-haemolytic streptococci, and endocarditis caused by the same organism, is apparently well documented (Cruickshank, 1968), yet to treat actively every case of vaginal infection due to the organism, as a prophylaxis against possible endocardial infection, would be regarded rightly as an unwarranted “panic” measure. Similarly, there is no indication for routine antibiotic therapy for all patients who receive an extradural block, on the supposition that there might be a bacteraemia.

We suggest that only those patients who do have evidence of systemic infection, should have treatment with antibiotics. Furthermore, anaesthetists should be aware that infection of free blood in the extradural space is a very rare event, but must be considered when the differential diagnosis of severe back pain is under discussion.

Finally, whilst it is true that blood is not infrequently released into the extradural space during the initiation of a block (and we hope shortly to report the incidence of this event in our practice) it is our opinion that the attendant very rare hazard is acceptable. However, it is possible that the practice of deliberately introducing blood into the extradural space is not so acceptable. This procedure, known as the “blood patch”, is a measure designed to prevent the occurrence of headache consequent upon an inadvertent dural tap, and is currently under discussion by the members of the Society of Obstetric Anesthetists and Perinatologists (the equivalent in the U.S.A. of the Obstetric Anaesthetists’ Association), although details have not been publicized generally, as far as we are aware (see Di Giovanni, Galbert and Wahle, 1972).

ACKNOWLEDGEMENTS
I am grateful to Mr Eric Turner (Consultant Neurosurgeon), and Professor O. L. Wade, and members of their respective staff, for the information and advice provided.

REFERENCES

LA PATHOLOGIE DANS L’ESPACE EXTRADURAL

RESUME
Le communiqué fait un rapport sur les cas d’une patiente qui a manifesté des signes d’infection extradurale 16 jours après l’accouchement et d’une autre sur laquelle un hématome extradural s’est développé spontanément. On traite de plusieurs points intéressants et qui méritent d’être considérés, en se basant sur ces cas particuliers.
PATHOLOGY IN THE EXTRADURAL SPACE

PATHOLOGIE IM EXTRADURALEN RAUM

ZUSAMMENFASSUNG

PATOLÓGIA DEL ESPACIO EXTRADURAL

SUMARIO
Se informa de ejemplos típicos de un paciente en el que se desarrollaron pruebas evidentes de infección extradural 16 días después del parto, y de otro en quien se desarrolló espontáneamente un hematoma extradural. Se discuten diversos puntos de interés e importancia que suscitaron estos ejemplos típicos.

ROYAL COLLEGE OF SURGEONS IN IRELAND
Faculty of Anaesthetists
ANNUAL SCIENTIFIC SYMPOSIUM

SATURDAY, MAY 17, 1975
“THE ANAESTHETIST AND THE SICK CHILD”

MORNING SESSION
Chairman: Dr R. W. COPE (Hospital for Sick Children, Great Ormond Street, London)
“The Assessment of the Sick Child”
Dr ROBERT M. SMITH (Children’s Medical Center, Boston)
“Hazards in Emergency Surgery in the Newborn”
Mr BARRY O’DONNELL (Our Lady’s Hospital for Sick Children, Dublin)
“The Management of Respiratory Failure in Infants and Children”
Dr JOHN J. DOWNES (The Children’s Hospital of Philadelphia)
“Croup” Dr KEVIN P. MOORE (Our Lady’s Hospital for Sick Children, Dublin)

AFTERNOON SESSION
Chairman: Dr S. H. S. LOVE (The Royal Belfast Hospital for Sick Children)
“Acquired Lesions of the Airway”
Dr TIOVO SUUTARINEN (Helsinki Central Hospital)
FILM: “Congenital Anomalies of the Larynx” by courtesy of
Dr PAUL HOLINGER (The Children’s Memorial Hospital, Chicago)

PANEL DISCUSSION
Chairman: Dr G. JACKSON REES (Alder Hey Children’s Hospital, Liverpool)

ANNIVERSARY DINNER
The Anniversary Dinner of the Faculty will be held on Saturday evening, May 17, 1975 at 7.15 for 8 p.m.