EPIDURAL GRANULOMATA IN THE PRESENCE OF TANTALUM PLATES*

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SINCE its introduction into neurosurgery,2,8 tantalum has been widely used for the repair of cranial defects. The large number of penetrating wounds of the brain during the recent emergency has afforded an excellent opportunity to employ tantalum in a wide variety of instances. There have been a number of thorough reports in the literature, indicating the efficacy of tantalum. While the enthusiasm with which this apparently non-cytotoxic and fairly malleable metal has been received is no doubt well justified, there seems to be a need for emphasis on the complications which can readily be encountered in the use of tantalum plates for cranial repair. Bradford and Livingston1 have enumerated these complications and have demonstrated failure in cranial repair with tantalum in 8 cases. These authors have already clearly stated the prerequisites for successful cranioplasty with tantalum.

It is the purpose of this communication to report an additional 11 cases in which removal of a tantalum plate was necessitated by the formation around the foreign body of a large infected epidural granuloma. Knowledge of this particular complication, which often does not manifest itself clinically for a long time after cranioplasty, seems particularly important in view of recent repeated advocacy of the use of tantalum in the presence of infection.4,9

CASE REPORTS

Two of the following patients (Cases 1 and 2) were seen and operated on by one of us (AMM) at time of the original injury. Both these patients as well as the other 9 received a cranioplasty elsewhere and were not seen by us until the symptomatology of an epidural granuloma manifested itself.

Case 1. R. D. received a through-and-through bifrontal gunshot wound in June 1945, which resulted in severe cerebritis and meningitis. The destruction of both frontal sinuses exposed the patient to repeated secondary infections. A solid tantalum plate was used for cranioplasty, which was performed elsewhere 1 year after the injury. The presence of a continuous low-grade infection beneath the plate manifested itself by repeated attacks of conjunctivitis and one acute attack of iritis.
of the left eye resulting in blindness. Removal of the tantalum plate and resection of an extensive epidural granuloma resulted in cure.

Case 2. F. K. received a compound, comminuted, depressed skull fracture by blunt injury in July 1945. Successive insertion of 3 tantalum plates elsewhere within 3, 7 and 10 months after injury was performed in the presence of a persistent chronic extradural infection. Permanent removal of the tantalum plate and total resection of the extradural granuloma, which appeared irregular in shape, consistency and color, resulted in cure. There were hemorrhages spread through the granuloma, one of them measuring 3 cm. in diameter. Some areas within the granuloma appeared necrotic, others were grayish-white and bluish in color. This granuloma represented the severest of all foreign body reactions that we have seen in the presence of tantalum and was comparable only to the pathology seen experimentally in the presence of cytotoxic metals. Follow-up studies of this patient have been carried out over a period of 30 months. He has remained asymptomatic.

Case 3. C. H. was struck by an automobile tire in his left frontal region in June 1948 and received a compound, comminuted, depressed fracture of the frontal bone. Four weeks later a CSF fistula developed which closed spontaneously in 10 days. A solid plate was inserted into a potentially infected wound 2½ months after injury. Conservative therapy with antibiotics did not alter the course of events which led to cure only following removal of the tantalum plate, epidural granuloma, and superimposed abscess.

Case 4. C. B. sustained a shrapnel wound of the brain in April 1945. According to his statement, shrapnel penetrated the left occipital bone and lodged in the right parieto-occipital region, necessitating bilateral craniotomy. Two months after injury, a tantalum cranioplasty was performed. In July 1948 the patient first noticed swelling and tenderness over the site of cranioplasty. This was accompanied by several episodes of chills and fever. On admission here an encapsulated abscess was found overlying the tantalum plate. The abscess was evacuated and the entire capsule was dissected out. Beneath this abscess was a solid tantalum plate, measuring not more than 3×2 cm. Between tantalum plate and dura a thin but grossly infected epidural granuloma was found and totally resected. The patient made an uneventful recovery. It is particularly of note that the bony defect in this instance was so small that it did not necessitate cranioplasty.

Case 5. T. G. sustained a gunshot wound of the right frontal area in February 1945. Because of recurrent drainage of pus from the original site of injury, he was operated on 4 times during a period of 5 months. The 4th operation included cranioplasty with a solid tantalum plate. There was a direct connection with the frontal sinus. The patient was asymptomatic for a year, then was treated by intermittent incision and drainage until August 1947 when he was admitted to Kennedy. Removal of the tantalum plate revealed grossly infected granulomatous tissue covering the outer surface of the tantalum plate. The patient made an uneventful recovery. Again, it is particularly noted that the bony defect measured only 2.5×1.5 cm., and actually did not necessitate cranioplasty.

Case 6. T. H. sustained a shrapnel wound of the right parieto-occipital region in June, 1944. The first solid tantalum plate was inserted 3 weeks after the injury. From the available records it appears that debridement was performed at the same