A SPINAL INJURY CAUSED BY A PATIENT IMPALED ON A SHOTGUN

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THE patient (B. J.), is a 43-year-old separated male brick-layer, who was in good health until 29 January 1974. He lost control of the automobile he was driving and struck a tree. An unloaded nickel-steel Winchester Model 12 full choke, 12 gauge shotgun, carried in the patient's automobile, was driven through the abdomen of the victim (fig. 1). The patient was taken by ambulance to the Watsonville Community Hospital, Watsonville, California. On examination in

FIG. 1

the emergency room by the general surgeon (J. F. D.), it was found that the muzzle had entered the right upper quadrant of the abdomen and was protruding from the left flank, three to four inches posteriorly. The patient was paraplegic with a sensory level of L2 bilaterally. The magazine chamber and stock of the shotgun were protruding anteriorly from the patient's right abdomen. The chamber and stock were partially covered by a green plastic gun carrying case. The distal end of the protruding barrel was plugged with smooth to ragged bone, and attached shredded cloth.

FIG. 2

FIG. 3

He was lucid, but in profound shock and had a laceration of the scalp. Blood pressure was restored with two litres of Ringers-lactate and approximately $1\frac{1}{2}$ litres of whole blood. Foley catheter was inserted, and urine found to be clear. Levine tube was passed and gastric aspirant was clear.

The patient was taken to the operating room, and intravenous pyelography was done. Since the patient's condition had stabilised, and while waiting the arrival of the neurosurgeon (C. J. S.), X-rays of the spine and abdomen were made. X-rays showed the barrel of the shotgun lying posterior to the vertebral body at L1 and L2 with involvement of the left pars interarticularis (figs. 2 and 3). There was no extravasation of dye noted in the I.V.P. study. Neurosurgical evaluation confirmed a motor-sensory level at L2 and no sacral sparing. An exploratory laparotomy was performed and the shotgun was removed from the abdomen through the portal of entry. Exploration demonstrated many fine wires present from a previous laparotomy following a stab wound in Baltimore, Maryland, in 1968. Old scar and fine wires were removed. Multiple adhesions were present. No blood, gas or intestinal content was present in the abdominal cavity. The path of the gun was found to lie under the right lobe of the liver, passing posteriorly and laterally to the duodenum and passed through the retroperitoneal space. No pancreatic damage was present. The barrel passed posterior to the vena cava, elevating it anteriorly and medially, and entering the vertebral body and its foramen at L1-2 on the right. There was difficulty in removal of the barrel due to protrusion of the gun sight on the barrel in the surrounding tissues. Appropriate closure was carried out.

The following day, neurosurgical lumbar laminectomy was carried out (by C. J. S.) from T12 to L2. This demonstrated that the shotgun barrel had entered

the foramen at L1-2 on the right side, transfixing the cord and fracturing and rotating outward the lamina of L1 on the left side. The fragments were removed and surrounding tissues were debrided of bits of cloth. The cord was swollen and a segment of dura was missing, but not repaired, due to the danger of a foreign body in the contaminated wound. The post-operative course was complicated by fever between 101° and 102°, which was subsequently controlled by Penicillin and Garamycin.

He was transferred to the California Spinal Injury System at Santa Clara Valley Medical Centre on 19 February 1974. At the time of this admission it was noted that all skin wounds were healed. The motor examination demonstrated L3 level on the left and L1 on right. His paralysis has been of the lower motor neuron type, only.

The patient was kept at bed rest until 4 March 1974. Following I.V.P., cystometrogram and urine cultures, his urine became bacteria free and he was started on intermittent catheterisation on 21 February 1974. He subsequently complained of severe burning dysaesthesia of right L1 area. On 28 March he started walking with bilateral long leg braces, and was noted to have heterotopic ossification of bone, primarily about the right hip. A 20° right hip flexion contracture was present at that time. The dysaesthesias and limitation of hip range of motion limited the rapidity of his comprehensive rehabilitation therapies. However, he became catheter free on 29 April 1974 and totally independent and discharged to home on 10 May 1974.

Since discharge, he has remained an out-patient in the Santa Clara Valley Medical Center Spinal Injury Resource Clinic. He has continued to practise ambulation with his braces, but has had severe abdominal and groin pain. He was discharged to out-patient status using:

1. Darvon 65 mg. q 6 h.
2. Parlax 240 mg. t. i. d.
3. Macrodantin 100 mg. q. i. d. × 10 days.
4. Ampicillin 500 mg. × 4 then 250 mg. q.i.d.
5. Carbenicillin 2 q.i.d. × 10.
6. Fe Gluconate 5 gr t.i.d.

Significant laboratory findings were as follows:

Hgb: 9.8 g. (9 May 1974)

Alk Phosp: 161 i.u. (20 February 1974)

261 i.u. (20 April 1974)

Bone Scintigraph: 5.3 × normal

Radioactivity in right hip, as compared with the left hip.

From 14 to 18 June 1974, the patient attended the United States National Wheelchair Games where he assisted the California team with food and social services. He is currently being served by the California State Department of Rehabilitation for vocational guidance and placement as an I.B.M. data technician.

There are several documented cases of penetrating and transfixing wounds which were the source of spinal cord injuries, (*see* References) but no case history was found in which an impalement wound of this type was described.

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