protective car design proceeds at three levels which are distinct and approached in the following order—research, standardization, enforcement. Whatever research evidence is used to formulate standards for protective car design that may ultimately be enforced, it seems clear that a fourth level of procedure is essential—namely, continual research into the actual crash performance of cars that have the new and developing protective designs and devices, so that the maximum degree of protection of occupants may be achieved.

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Scrotal Gangrene after Male Sterilization

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Since Fournier (1884) first described idiopathic scrotal gangrene there have been sporadic case reports and various theories concerning its aetiology. The present case, following the operation of vasectomy, is of interest in view of the increasing popularity of male sterilization.

Case Report

A healthy 49-year-old man was sterilized on 20 November 1969. The bilateral vasectomy was performed under local anaesthetic (1% lignocaine without adrenaline) and the initial postoperative period was uneventful. On his way to work on 3 December he felt unwell and returned home to bed with fever, headache, and rigors. That night he developed a severe pain in the scrotum and was visited by his family doctor. The scrotum was swollen and red; the incision on the left side was soundly healed but that on the right side was a little moist. The pain and swelling subsided after treatment with tetracycline, 250 mg four times a day, but suddenly over the course of 36 hours the skin started to ulcerate.

He was admitted to hospital on 15 December when he looked well and was afebrile (98.8°F; 37.1°C). The scrotal skin was gangrenous and in places it had sloughed away to expose the testes. Investigation showed a haemoglobin of 13.4 g/100 ml and a white cell count of 13,200/mm³ (80% neutrophil polymorphs). There was no glycosuria, and a midstream specimen of urine was sterile on culture. A swab from the scrotum showed pus cells and lactose-fermenting organisms.

When the necrotic scrotal skin was removed under a general anaesthetic, healthy testes and cords were exposed (Fig. 1). Histological examination of the scrotal skin showed complete necrosis with a pronounced neutrophil leucocytic infiltration of the deeper tissues and the skin itself. A few small vessels were occluded by thrombus. Many unidentified Gram-negative cocci were present.

A further scrotal swab yielded a growth of lactose-fermenting coliform and *Proteus* organisms. Both organisms were sensitive to ampicillin, and 500 mg four-hourly was given during the next week. The condition of the scrotal skin rapidly improved with daily eusol dressings and the local application of polybactrin. Suf-

FIG. 1—Appearance after debridement of scrotal slough.

ficient re-epithelization had occurred after four weeks to allow the patient to continue with dressings at home. One month later the scrotum was completely healed.

Comment

This case illustrates many of the characteristic features of Fournier's gangrene with the explosive onset of toxæmia and the rapid progression of scrotal gangrene in a previously healthy patient. Though the aetiology of the disease remains obscure, the scrotal incisions in this case must be implicated as the likely site of entry for the infection. Randall (1920), in a review of 16 cases, found that six had neighbouring local lesions which may have acted as a portal of entry. Thomas (1956) observed that the condition was secondary to such lesions as balanitis, chancroid, or minor abrasions in about one-third of the cases and noted its occurrence following circumcision, herniorrhaphy, haemorrhoidectomy, incision of perirectal abscess, and injection of a hydrocele.

The occurrence of scrotal gangrene after vasectomy has not been previously reported. It should not deter patients from this form of sterilization, as there were few complications in a recent review of 1,000 cases of male sterilization (Simon Population Trust, 1969). The risks associated with female sterilization are greater, though these will be reduced by the greater use of endoscopic sterilization (Steptoe, 1970).

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