Chapter 17

Azoospermia and Surgery for Testicular Obstruction

W.F. Hendry

Introduction

This chapter opens with a description of the anatomy and physiology of the male genital tract, and this is followed by a review of the pathological conditions that produce obstruction in particular sites. Preoperative clinical and laboratory assessment are next, matters of key importance if the surgeon is to recognise and interpret accurately the findings made at surgery. Operative approaches and technical details of reconstructive methods are described, fundamental for successful results. Long-term follow-up is essential if accurate audit is to be maintained, to allow the surgeon to compare his results with those reported by others; and finally failure — when should the surgeon give up, and when should he or she reoperate, to try again to make the perfect anastomosis and have it stay patent?

Clinical Anatomy

The structure of the male genital tract is shown diagramatically in Fig. 17.1, the external appearances on the right side corresponding to the internal structures detailed on the left. The parenchyma of the testis is composed of large numbers of convoluted seminiferous tubules, each of which is a continuous loop with its convexity anteriorly, uniting with adjacent tubules posteriorly to open into the rete testis. The spermatozoa leave the rete through 15–20 minute tubules called the ductuli efferentes which pierce the tunical albuginea and enter the caput epididymis, where they become convoluted to form little conical masses called the lobules of the epididymis. The ductuli efferentes have a thin layer of smooth muscle in their wall and are lined by ciliated columnar epithelium. These cilia have microtubules in a 9 + 2 arrangement with dynein arms, similar to those found in the naso-respiratory passages and in the sperm tails. The ductuli efferentes and lobules of the head of the epididymis derive embryologically with the testis from the urogenital ridge. At the junction of the caput and corpus epididymis, the ductuli efferentes unite into the single duct of the epididymis, an extraordinarily tortuous tube, about 60 cm long in man, which forms the corpus and cauda epididymis. This duct derives from the wolffian duct and thus the
junction between the head and body of the epididymis is a meeting point between different embryological structures. The epididymal duct is lined by pseudo-stratified columnar epithelium with microvilli, surrounded by circular non-striated muscle. These microvilli are often called stereocilia, but they are not true cilia, being concerned with fluid reabsorption and the maturation of spermatozoa as they pass through the epididymis.

At the tail of the epididymis the ductus deferens is formed, which has a thick muscular coat composed mostly of circular fibres, together with inner and outer longitudinally directed fibres. The muscular wall becomes thicker as the ductus leaves the epididymis to continue in the spermatic cord where it is commonly referred to as the vas deferens. About 45 cm in length, it is convoluted at upper and lower ends, so that the actual distance transversed is not more than 30 cm. After passing through the inguinal canal, the vas parts company with the testicular vessels to curve medially across the side wall of the pelvis. After hooking round the ureter, the vas passes downwards and medially behind the base of the bladder where it becomes sacculated and dilated to become the ampulla. Immediately above the base of the prostate the ductus deferens becomes once more a slender tube and is joined by the duct of the seminal vesicle to form the ejaculatory duct. This delicate tube is less than 2.5 cm in length, and lies close to its fellow on the other side as it passes downwards and forwards through the prostate behind its median lobe. The ducts open by slit-like apertures into the prostatic part of the urethra, one on each side of the mouth of the prostatic utricle on the verumontanum.

The blood supply to the testicle is provided by the testicular artery, a branch of the aorta. This artery becomes somewhat coiled as it approaches the testis,