Use of Jonas Silicon-Silver prosthesis in erectile impotence¹

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Summary: Eleven patients presenting over the last three years with erectile impotence who have been treated by the insertion of the Jonas Silicon-Silver penile prosthesis are reviewed. The insertion of this prosthesis is a minor procedure. It has a simple design, low cost, no permanent erection or mechanical problems and an excellent cosmetic and functional result.

Introduction

Until recently, erectile impotence has been managed by a combination of urological and endocrine assessment, psychiatric treatment, sex counselling and hormone treatment when indicated. The results have been disappointing (Masters & Johnson 1970, Ansari 1976).

In patients with irreversible erectile impotence, the implantation of a penile prosthesis may prove satisfactory. A series of 11 patients in whom the Jonas prosthesis was inserted is now reported.

Methods

The Jonas prosthesis (Jonas & Jacobi 1980) is made of silicone rubber within which twisted silver wires are embedded. This allows for voluntary bending of the penis for urination and resting position and for straightening for coitus.

Eleven patients were studied. One was aged 30 years, two were 40–50, six were 50–60 and two were over 60 years. Five had Peyronie's disease, two had diabetes mellitus, one spina bifida and there were three with psychogenic impotence. The length of history varied from one to five years.

Preoperative investigations included a full blood picture, electrolytes and urea, blood sugar, chest radiograph, and an intravenous pyelogram and ultrasound of the bladder in those patients with symptoms of outflow obstruction. All patients had hormone studies, which included serum follicle-stimulating hormone and luteinizing hormone, serum testosterone and serum prolactin.

The operative approach (Jonas & Jacobi 1980) began with a hemicircular incision made on the dorsal surface of the penis in the sulcus coronarius. Buck's fascia was identified and the tunica albuginea was opened between two stay sutures. Dilatation of the corpora was carried out proximally to the crura and distally underneath the glans, starting at about 6 mm and continuing up to 11 mm. This was performed with Hegar's dilators. Subsequently the prosthesis was inserted without any problems. The prosthesis was fitted into the straightened corpora without tension. For the safe placement of the prosthesis tip underneath the glans, the corpus was lifted with an eyelid retractor. Closure was in layers with Dexon sutures.

The operative procedure took about thirty minutes and was covered by intravenous cephalosporin and metronidazole. A urethral catheter was not routinely used.

¹Based on paper read to Section of Urology, 27 January 1983. Accepted 28 July 1983

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All patients were sent a detailed questionnaire in addition to having a follow-up outpatient appointment. The questionnaire asked for information from the patient and his sexual partner regarding the success of the operation.

Results

The follow up varied from 9 to 35 months, with a mean of 21.7 months. Early complications of the operation included spontaneous extrusion of one side of one implant and one urinary tract infection. There were no late complications. Three patients had a suprapubic catheter inserted: the patient with the extruded implant, the patient suffering from spina bifida and one patient in whom the urethra was breached peroperatively.

All patients said the operation was a success, all were having sexual intercourse and there were no functional problems. The sexual partners confirmed this. Two patients said they had some embarrassment with the prosthesis.

Discussion

The causes of irreversible erectile impotence have been described by Pryor (1981) (Table 1). Such patients may be satisfactorily treated by the implantation of penile prostheses.

Other methods which have been used to identify men with organic impotence (Morgan & Pryor 1980) include the assessment of penile arterial perfusion, nocturnal tumescence studies, cystometry and cavernosography.

Early penile prostheses were made of materials such as cartilage and bone (Bogoras 1936), acrylic (Goodwin & Scott 1952), silicone rubber (Lash 1964), and polyethylene rods (Beheri 1966). These were generally unsatisfactory, cosmetically and functionally. Pearman (1967) developed the first silicone prosthesis which he placed dorsally between Buck's fascia and the tunica albuginea. They were superseded in the 1970s by two further prostheses. The Small-Carrion prosthesis consists of two semi-rigid, moulded, silicone shells with sponge-filled interiors, and it is implanted via the perineum into the corpora cavernosa (Small & Carrion 1975). The Scott prosthesis consists of two inflatable silicone cylinders which are placed in the corpora cavernosa through a midline incision and connected by silicone tubing to a pumping mechanism implanted in the scrotum. When the scrotal bulbs are pumped, inflation fluid stored in a reservoir behind the anterior rectus sheath enters the prosthesis, producing an erection; a release valve allows the fluid to return to the reservoir (Scott *et al.* 1973).

The surgical treatment of erectile impotence has advanced significantly since the introduction of the inflatable and the paired rigid rod prostheses in the early 1970s. The overall functional success of these prostheses is 90–95% (Small 1978, Malloy *et al.* 1980) and this has been achieved in the present small series. However, the complications, satisfaction and cost do vary between the semi-rigid and the inflatable prostheses. The predominant advantage of the Small-Carrion prosthesis is a lack of mechanical parts that may malfunction. The main limitation is a permanent erection: rigidity cannot be varied, neither can the length or girth of the penis. Thus, an erosion can result from constant pressure and can occur in 9–10% (Kramer 1979, Malloy *et al.* 1980). Embarrassment in public places can

Table 1. Causes of irreversible erectile impotence

Vascular: Major vessel disease Minor vessel disease Priapism	Trauma: Fractured pelvis Ruptured urethra Spinal cord injury
Neurogenic: Autonomic neuropathy (diabetes) Paraplegia Multiple sclerosis Other cord lesions	Postoperative: Abdominoperineal resection Cystectomy Radical prostatectomy Aortoiliac surgery

be a major problem for the patient. An endoscopic operation is difficult because of a fixed penile length.

The predominant asset of the inflatable prosthesis is a natural-appearing erection. The variation in rigidity diminishes the chances of erosion of the glans penis. However, the main disadvantage is the mechanical failure rate which varies from 10–35% (Furlow 1978, 1979, Malloy *et al.* 1980, Kessler 1980) and secondary operations have been necessary to correct faults – cylinder rupture and pump failure being the main problems. The other disadvantage of the inflatable prosthesis is its cost, being three times as expensive as others on the market.

The silicone silver prosthesis was designed to incorporate many of the positive features of the devices already in use. It is cheap (£300), is very easy to insert and with its spiral silver wire centre allows infinite flexibility with greater rigidity than the Small–Carrion device. Perforation occurred in one side of one implant in the series; it was removed and the patient remained happy with a functional and good cosmetic result. In another series of 32 patients (Jonas & Jacobi 1980), successful results were achieved in 30 patients, with one perforation through the glans penis. This complication is almost certainly due to the implant being too long and causing undue pressure on the glans. Rupture occurs medially into the delicate urethra. Fine adjustment to the length can be made by trimming the implant proximally.

Embarrassment resulting from the permanent semi-erection was minimal. Most patients were able to cope easily once they had adjusted their underwear to their own special requirements.

A recent study in which the wives of recipients of a Small–Carrion prosthesis were interviewed (Kramarsky–Binkhorst 1978) showed that several men had not used their implants months after receiving them and some wives were not even aware that their husbands had them. In our series all patients presenting for operation together with their sexual partner, whenever possible, had detailed counselling about the operation.

Most surgeons follow up only the men with the implants to check surgical results and possible complications. A response of no complaint may mean that coitus is satisfactory for both the patient and his partner, but this should not be assumed. It is important to ask both parties. All patients were sent a detailed questionnaire asking for information from the patient and his sexual partner regarding the success of the operation.

Nocturnal tumescence studies (Karacan 1969) were not carried out in this series as a positive result may not preclude an implant. The patients' complaint is one of inability to get or maintain an erection when required. The three psychogenic patients amongst our cases attributed the success of the implant to their ability to have sexual intercourse on demand and because they were able to produce some erection around the prosthesis. The implant apparently does not abolish the erectile mechanism when present. Vascular studies were also not carried out as some are invasive and there is little evidence that reconstructive vascular surgery, at best, does more than contribute temporary relief of impotence (Michal *et al.* 1980). It is important, however, to rule out disorders of the hypothalamic–pituitary–gonadal axis as causes of the erectile impotence by screening serum testosterone (Spark *et al.* 1980).

It is the authors' view that after a patient with erectile impotence has undergone a full history, examination, sex counselling together with his wife and a normal endocrinological evaluation, then a penile prosthesis may be indicated. The final decision rests on clinical judgment and common sense.

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