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SUBMITTED FOR PARTIAL FULFILMENT OF
MASTER DEGREE IN UROLOGY

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1986

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ACKNOWLEDGMENT

- First, I wish to express all my thanks to God, who is behind every success.
- I am greatly indebted to my professor Dr. Abd-El Fatah Agour professor of Urology, Ain Shams University, for his valuable help, esteem advice, kind supervision, great interest and continuous guidance and encouragement.
- Finally, I would like to express my heartfelt thanks to my wife and family especially my brother Dr. Tarek who shared in many ways to get this thesis in a good form.

Dr. Osama F. Kaldas.



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INTRODUCTION

- Advances in biomedical technology have multiplied the use of prostheses in the field of urology.
- The materials which are used for prosthesis surgery have undergone a lot of changes in the structure and the design so that they become inert and less reactive to the tissues. Also meticulous surgical technique and proper choose of the patient have decreased the frequency of complications and give better results.
- Experience with modern designs of semirigid and inflatable penile prostheses had made operative management an established mode of treatment for erectile impotence.

Although the semirigid prostheses differ in flexibility, they all impart a constant state of semirigidity to the penis.

The first inflatable penile prosthesis was implanted in February 1973.

Since that time, both the device as well as the techniques for the implantation have undergone multiple modifications and improvements.

The patient should be educated to the relative advantages and disadvantages of each device and participate in the selection process.

- Total urinary incontinence may be considered a social malignancy. With improved technology during recent years, implantation of an artificial urinary sphincter has become a viable treatment option that now can be offered to many of these patients.

The original device introduced by Scott and Associates in 1973 has been modified gradually to make it simpler and more effective. The concept of delayed activation was introduced in an attempt to reduce the number of erosions.

(2)

- The absence of one or both testicles in males of any age may and often does cause psychological and cosmetic problems. Many materials are available for testicular prostheses. Silicone rubber is the best material because it is easily shaped, easily sterilized without change in appearance and consistency, and has caused no tissue reaction.
- During the last decade, many attempts have been made to produce an inert synthetic prosthesis to replace a diseased ureter. Various synthetic materials have been used, but the results have been disappointing. The main problems have been the intolerance of the organism to the foreign materials, obstruction of the prosthesis, urinary leakage, dislodgement of the prosthesis, infection and reflux.

Recently, Gore-Tex which is a new expanded form of polytetrafluoroethylene (PTFE), has been used as ureteral prosthesis in dogs. Also collagen sponge tube grafts were tried for segmental ureteral replacement in dogs. The results were encouraging.

In view of these results, further studies are needed for the improvement of anastomotic techniques and modifications of these materials.

PENILE PROSTHESIS

- Prosthesis surgery for management of erectile impotence has become an increasingly important aspect of urology.
- This improved treatment is particularly important in this era of awareness of the many adverse effects of impotence, which impairs not only the sexual ability of a man and thus relations with his partner, but also the man's self- image and therefore his interactions with others in society.
- Which patients are suitable candidates for implantation ?

- (1) The impotent male whose dysfunction is due to irreversible organic causes is a potential candidate for a prosthetic device provided there are no associated physical or psychologic factors which would mitigate against implantation, and provided both the patient and his sexual partner have realistic postoperative expectations .
- (2) The psychologically impotent male may be an acceptable candidate for a penile implant if he is not considered to be suitable for conservative sex therapy or if he is refractory to sex therapy.

(Furlow W.L. 1981)

- A vast majority of implantable penile prostheses are now available .

Essentially these can be divided into two types :-

- 1 - Semirigid penile prostheses.
- 2 - Inflatable penile prostheses .

(I) Semirigid Prostheses that are currently available

- 1 - Small - Carrion prosthesis
 - 2 - Flexi - rod prosthesis (Finney design) .
 - 3 - Jonas malleable penile prosthesis (silicone - silver penile prosthesis).
 - 4 - Silicone prosthesis (Gerow design) .
- Although these devices are said to differ in flexibility , they all impart a constant state of semirigidity to the penis .

(1) The small - carrion device

- It is constructed of a medical-grade silicone rubber exterior filled with silicone sponge.
- The proximal end is solid and is curved to fit the crus of the corpus cavernosum.
- This paired device is available in lengths of 12 to 22 cm. and diameters of 0.9, 1.1 and 1.3 cm. A sizer set containing a rod of each size is available for intraoperative measurement.(Although the size of the prosthesis can be adjusted during the operation by cutting, shaving and sanding, we believe these practices are best avoided).

(Narayan p. and lange p.H. 1981)

- Therefore all or nearly all sizes must be available for each operation. (considered as disadvantage for the device).
- Another disadvantage of the device is its uniform rigidity, which may require the patient to take precautions to avoid embarrassment as a result of constant erection, but this usually does not happen because;

(5)

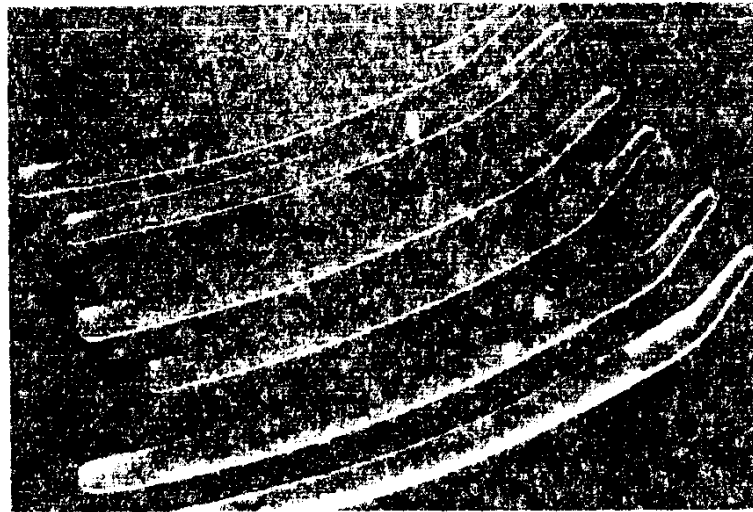
- a - The anatomic configuration of the penis permits the organ to be positioned downward .
- b - Minor changes in clothing and behavior help to conceal the organ.

(2) The Flexi-Rod penile prosthesis (Finney design).

- The Flexi-Rod penile prosthesis was designed with three unique features not found in other semirigid implants.
- a- Flexirod prosthesis has a moderately stiff distal segment which is positioned within the penile shaft. Proximal to this is a softer segment of silicone elastomer 5 cm. in length which is positioned at the penile base and beneath the pubic bone. This segment serves as a hinge which allows the penis to hang in a dependent position and provides for improved concealment. The proximal end of the device is semi-stiff made of silicone rubber used to anchor the device in the crus.
- B- The Flexirod prosthesis has a trimmable proximal end which allows it to be cut to the correct total length during surgery.

This unique feature allows a considerable saving in the hospital expenses. Only one prosthesis need to be available for a given patient at the time of surgery (not a complete set of lengths for each surgical procedure as with other semirigid prostheses).
- c - The third important feature is its tapered tip which provides improved stability for the glans and the so-called SST deformity (a ventral deviation of the glans) is prevented.
- This tapered tip is also able to pass further beneath the glans . . . than one having a blunt tip, and the ball-and- socket motion occurring with blunt-tipped prostheses is prevented.

(6)



Small carbon prosthesis. This paired device is available in lengths of 12 cm to 22 cm and diameter of 0.9, 1.1, and 1.3 cm.



A) Flexirod Penile Prosthesis made of clear silicone showing tapered tip, more rigid distal shaft, softer hinge section, and trimmable proximal end which is divided into 0.5 cm sections. (B) Prosthesis deflected at the softer hinge.

(7)

- More recently a Flexirod II prosthesis which has a more rigid distal segment has become available. This new feature provides more rigidity and better functional results in those requiring a smaller diameter or a longer than average length.

(Finney R.P. 1984)

(3) Jonas Malleable penile prosthesis

(Silicone - silver penile prosthesis)

- This prosthesis with the malleable silver core was originally introduced in an attempt to provide a semirigid rod prosthesis which would hang dependently when not needed for coitus and project at right angle from the body when needed for sexual intercourse .
- Another use of the malleability provided by the silver core is that it allows for simultaneous correction of erectile deformities such as the chordee associated with Peyronie disease.
- This prosthesis is made of silicone rubber with a distal tip of significantly lower resistance to prevent perforation through the glans.
- Embedded in this silicone rubber are twisted 999.7 per mill. silver wires, which have the characteristic of not fatiguing, breaking or hardening under continuous bending.

They are designed to permit manual direction and stabilization of the penis in various positions, erection for intercourse and downward for micturition or resting position .

(Jonas U. and Jacobi G.H. 1980)

(4) silicone penile prosthesis

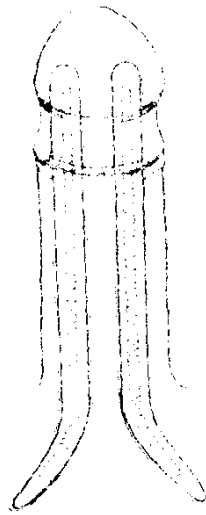
(Gerow design)

- It is made of medical-grade silicone elastomer and consists of two rods connected by a grooved midline septum.
- The device is placed in the corpora after the septum between them has been divided.
- Because the proximal end of this device does not extend into the crural portion of the penis, a hinge effect is obtained, allowing the penis to behave much like a normal flaccid organ..

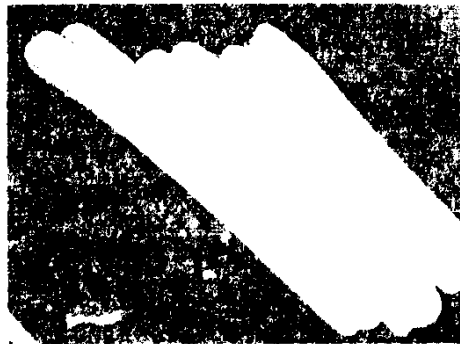
Technique of implantation:-

(A) Preoperative preparation :

- The patient's urine is cultured for 24 hours prior to surgery. if there is any evidence of infection, surgery is postponed.
- The patient is given a loading dose of parenteral broad-spectrum antibiotic nearly two hours prior to surgery and is maintained on these for 24-48 hours postoperatively.
- 10 minutes povidone-iodine-scrub shower the night before and the morning of the operation.
- The abdomen, pelvis and perineum are shaved in the operating room, scrubbed for 15 minutes and double-towelled.
- The surgeon will also scrub his hands for approximately 10 minutes and then have antiseptic solution on his hands.



A schematic representation of the penile prosthesis. It is made of silicon rubber with a core of twisted steel wires.



The silicone penile implant (cylinder design). It consists of two rods connected by a grooved midline septum and is available in three sizes.