Sizing Penile Prosthesis Length as per the Erect Penile Length: Experience from Cases of Unresolved Ischemic Priapism

Original Article

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ABSTRACT

Introduction: Among the reasons for patient dissatisfaction following penile prosthesis implantation (PPI) is decreased length, possibly due to implantation as per the flaccid stretched length, which is shorter than the erect length**.**

Aim of Study: To examine safety of sizing implant length as per the erect state, and its efficacy in enhancing patient satisfaction, by evaluating outcome of implantation in patients with refractory ischemic priapism operated upon early enough before fibrosis sets in.

Patients and Methods: Patients for the study were recruited in the past 2 years. Nineteen post-priapism patients comprised the study group (SG), and 21 non-priabitic cases comprised the control group (CG) who were treated for ED refractory to oral medication and intr-cavernosal injection. PPI was performed as per the erect length for the SG and the flaccid stretched length for the CG. At final follow up (46 ± 12.4 months), subjective patient's impression of length compared to his recall of erect pre-ED/pre-priapism length was recorded as either "almost the same", "shorter" or "longer", and patient's satisfaction with length was recorded on a 5-point Lickert scale. Complications were reported.

Results: In the CG all patients reported a shorter length (100%), in contrast to 5.3% in the SG .Satisfaction with length was 57.1 % higher in the SG compared to CG (mean satisfaction 5, and 2.1 ± 0.96 respectively, p=0.048). None of the cases in either groups encountered anterior or posterior perforation/extrusion) or persistent pain beyond 2 months post-operatively. Clinical Implications : Penile prosthesis implantation as per the erect length and not the flaccid stretched length may be safe and effective in preserving length.

Conclusion: Penile prosthesis implantation in the erect state post-priapism was safe and offered higher satisfaction with length, and it is therefore safe and favorable to implant prostheses as per the erect length in other cases.

Key Words: Length, penile implant, penile prosthesis, satisfaction.

Received: 3 June 2017**, Accepted:** 12 November 2017

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ISSN: 2090-7265

INTRODUCTION

Penile prosthesis implantation (PPI) is broadly a satisfactory and effective treatment for erectile dysfunction (ED). It is the treatment of choice in patients who failed to respond to more conservative alternatives (oral treatment, vacuum devices and intra-corporal injection of vaso-active substances (ICI)) and in patients in whom the fore mentioned options are contraindicated or unsatisfactory[1, 2].

Although most patients following implantation say they would choose the procedure again[3, 4], the rate of dissatisfaction may reach up to 72% according to Deveci *et al*[5]. The cause for dissatisfaction could be subjective or objective. Among the reasons for dissatisfaction is decreased length. A penile prosthesis is implanted as per the flaccid stretched length, which is shorter than the erect length. Comparing ICI-induced erect pre-implantation length to post-implantation length revealed statistically significant shortening following implantation[6]. This shortening is further accentuated in patients with Peyronie's disease, a concealed penis due to overhanging suprapubic fat pad, following radical prostatectomy, among others.

Due to the relatively common complaint over shortening following PPI, a number of techniques have been devised to increase patient satisfaction. These techniques include ventral phalloplasty[3], suspensory ligament release[7], suprapubic lipectomy and liposuction[8, 9], and augmentation corporoplasty[10, 11], in

 DOI: 10.21608/jgs.2017.1114.1000

addition to the use of length and girth-expanding implants. Tacking the peno-pubic junction to the pubis has recently been shown to enhance satisfaction with length[12]. Pryor *et al.* reported improved patient satisfaction and penile length with postoperative rehabilitation, where patients were instructed to inflate the implant daily for 6 months and then inflate maximally for 1-2 h daily for 6-24 months[13].

AIM OF STUDY

We propose that sizing the penile prosthesis in the erect state rather than in the customary flaccid stretched state may enhance length and satisfaction. This work examines safety of this concept and efficacy in enhancing patient satisfaction with length, by evaluating outcome in patients with refractory ischemic priapism operated upon early enough before fibrosis sets in, where implantation is performed in the erect length.

PATIENTS AND METHODS

Through the period from January 2010 to February 2014, penile prosthesis was implanted for nineteen post-priapism patients who comprised the study group (SG). 21 non-priabitic cases comprised the control group (CG). The SG comprised patients with refractory ischemic priapism operated upon within 30 days from the incident, following failure of conventional techniques including aspiration/irrigation and shunt surgery. All SG patients confirmed that the penis was in the fully erect state and with the same length of erection before priapism had set in. For the CG, patients with prior dissatisfaction with penile length, Peyronie's disease, penile concealment, previous penile surgery and those with post-radical prostatectomy were excluded. Furthermore, patients who had prosthesis infection and explantation due to reasons other than anterior perforation were excluded.

External length of the pendulous penis was measured using rigid ruler before implantation, from pubis to tip (pre-operative true length (Pre-TL)), in the erect state for the SG, and in the flaccid stretched state for the CG. PPI was performed through a peno-scrotal incision. Semi-rigid implants were used in all cases (Coloplast Genesis, USA) due to financial considerations and insurance coverage protocols in the country where the study was conducted. Length expanding implants were not used. Dilatation was performed using Brook's dilators, with none of the priapism patients requiring fibrous tissue resection methods considering that priapism was less than 30 days old. Intra-corporal length (ICL), proximal and distal, was measured using a calibrated #10-French metal dilator. Implantation was performed as per the erect length for the SG and the flaccid stretched length for the CG, according to ICL. No adjuvant elongation measures were performed in any of the patients.

Post-implantation, external length of the pendulous penis from pubis to tip (post-operative true length (Post-TL)) was recorded. For patients in the study group who had a distal shunt performed (n=6, Table 1), a Gortex windsock was used to secure the distal tip, and patients were instructed to postpone sexual activity for two months post-operatively.

At final follow up (46 ± 12.4 months), subjective patient's impression of length compared to the recall of erect pre-ED/pre-priapism length was recorded as either "almost the same", "shorter" or "longer", and patient's satisfaction with length was recorded on a 5-point scale:

How do you rate you satisfaction with the length of the penis following surgery?

-Extremely dissatisfied

-Dissatisfied

-Neither satisfied nor unsatisfied

-Satisfied

-Very Satisfied

Complications -if any- were reported.

Statistical analysis was performed using Microsoft Excel 2010 and SPSS for windows version 19 (International Business Machines Corp. New York, USA) Results were expressed in mean ± standard deviation (SD), frequencies (number of cases) and percentages when appropriate. Comparison of means was performed using Paired Samples T Test. Student T test was used to evaluate statistical significance for continuous numerical values. Chi Square test was used to evaluate statistical significance for categorical values. A probability value (p value) less than 0.05 was considered statistically significant.

RESULTS

The mean age was 34.7 years ± 9.3 for the SG and 54 years ± 8.5 for the CG. For the study group, there was a minimal difference of 1.6 % in Pre-TL and Post-TL (14 ± 2.7cm and 13.8 ± 2.6cm respectively, p= 0.0003). Similarly, for the control group, there was a 0.8 % difference between Pre-TL and Post-TL (13.2 ± 1.4 cm and 13.1 ± 1.2 cm respectively, p=0.278)

However, in the CG where sizing and implantation were performed in the flaccid stretched state, all patients reported a shorter length (100%), in contrast to the

SG where sizing and implantation were performed in the erect state, 18/19 of patients reported that length was almost the same as the pre-priapism length (94.7%) with only one patient reporting a shorter length (5.3%) (Figure 1). Satisfaction with length was 57.1 % higher in the SG compared to CG (mean satisfaction 5, and 2.1 ± 0.96 respectively, p=0.048). None of the cases in either groups encountered anterior or posterior perforation/extrusion) or persistent pain beyond 2 months post-operatively (Table 1).

Table 1: Demographics and outcome

Study Group (priabitic cases)								Control Group (non-priabitic cases)							
Age	Intervention for Priapism	Prosthesis	Pre-TL	Post-TL	Iplmant Length	Impression of Length	Satisfaction with Length	Age	Etiolog	Prosthesis	Pre-TL	Post-TL	Implan Length	Impression of Lenght	Satisfaction with Length
24	AI + DS	2P	10.0	9.5	21.0	Same	5	63	VOD	2P	12.6	12.2	23	Shorter	2
25	AI	3P	12.1	12.0	22.0	Same	5	45	A	3P	12.9	12.5	25.5	Shorter	2
27	AI + DS	3P	14.0	13.7	24.0	Same	5	52	A	SR	10.7	10.7	20.5	Shorter	2
33	AI	2P	17.7	17.2	26.0	Same	5	43	A	3P	13.0	13.4	24	Shorter	3
56	AI	2P	16.1	15.7	24.0	Same	5	54	A	SR	15.3	14.9	25	Shorter	3
42	AI + DS	3P	12.3	12.2	23.5	Same	5	62	VOD	SR	13.0	13.1	22.5	Shorter	2
36	AI + DS	3P	11.6	11.6	21.0	Same	5	55	VOD	2P	14.8	14.4	24	Shorter	3
31	AI	3P	16.0	15.8	24.0	Same	5	47	A	SR	12.2	11.8	22	Shorter	3
29	AI	3P	14.8	14.9	23.0	Same	5	48	A	3P	11.4	11.1	22.5	Shorter	3
34	AI	2P	10.8	10.3	21.0	Same	5	55	VOD	3P	15.0	15.1	25	Shorter	3
30	AI + DS	3P	10.1	10.1	20.0	Same	5	53	A	2P	13.0	12.6	22	Shorter	1
32	AI	3P	17.8	17.3	25.5	Same	5	62	VOD	2P	12.9	12.5	23	Shorter	4
40	AI	3P	12.5	12.2	26.0	Same	5	51	A	3P	14.4	14	25	Shorter	3
31	AI	3P	15.0	15.0	24.0	Same	5	49	VOD	3P	13.2	12.8	24	Shorter	2
34	AI	3P	12.4	12.2	22.0	Same	5	67	VOD	2P	15.5	15	25.5	Shorter	3
45	AI	3P	17.0	16.8	25.0	Same	5	49	A	3P	14.6	14.2	23	Shorter	1
56	AI	SR	12.5	12.5	22.5	Shorter	5	56	A	3P	13.0	12.9	22	Shorter	1
29	AI	3P	14.8	14.8	25.0	Same	5	57	VOD	2P	14.2	13.8	22	Shorter	1
26	AI + DS	SR	18.5	18.0	26.0	Same	5	46	VOD	2P	12.8	13	23	Shorter	1
								44	VOD	3P	11.0	12	21.5	Shorter	1
								77	VOD	2P	12.0	13.1	24	Shorter	1

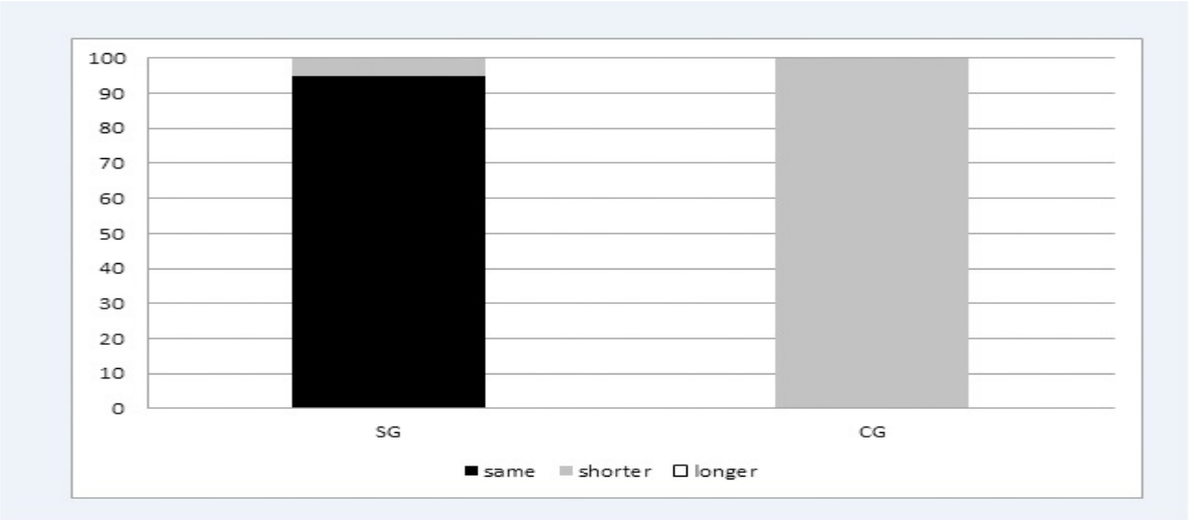

Fig. 1: Impression of length in the study and control groups

DISCUSSION

Penile size has been associated with male self-esteem and ego since ancient times. Concerns over genital size have been shown to increase incidence of ED[14]. Satisfaction rates for PPI are quite high, 93.8% in one case series[15]. However, many patients complain of reduced penile size post operatively. Some studies have shown the decreased penile length after PPI to be a misperception, nevertheless, it has a negative impact on the EDITS and the IIEF satisfaction domain (63.7 vs 60.8 and 6.5 vs 3.5 respectively)[5]. Along the same line, Wang *et al*. confirmed a decrease in penile length from 0.2 to 3.0 cm after PPI compared to the pre-operative erect length. In that study, 45% of patients complained of penile shortening post operatively, and none reported increased length[6]. The cause of ED can influence patient satisfaction following PPI. Bozkurt *et al.* reported that patients who had undergone radical prostatectomy and their partners were found to have lower satisfaction rates following PPI, compared to patients with other causes of ED[16].

Various surgical techniques were devised to improve penile length following PPI to increase patient and partner satisfaction. Length and girth expanding implants (LGX) have also showed increased satisfaction. Despite effectiveness of the fore mentioned techniques, they do harbor some drawbacks such as the higher mechanical failure of the LGX, and the additional surgical procedures if surgical length enhancement is resorted to, along with their possible complications. In addition, those solutions circumvent rather than address the root problem, which is sizing the implant according to the flaccid stretched length rather than the erect penile length, which is commonly adopted to avoid perforation and extrusion.

The proposed hypothesis of the current study assumes that implantation as per the erect length is both effective and safe, and is herein proven by outcome in cases of implantation shortly following ischemic priapism compared to non-priabitic cases, in terms of both satisfaction with length and non-occurrence of anterior perforation. Penile length shortly after ischemic priapism is closest to that of natural erection. When PPI is performed at that point, sizing of the implant is as per the erect length rather than the flaccid stretched. Since the outcome in such cases is safe and favorable, then it may be safe and favorable to implant prostheses as per the erect length in most other cases. Execution of this concept can be through intraoperative induction of erection by intracavernous injection of the maximum dose of vaso-active substance, supplemented by saline intracavernous injection, against basal compression if needed. The length of cylinders in the SG and CG groups were comparable (Table 1). This does not mean that implantation as per the erect length did not require longer cylinders. It merely means that original penile length of patients in the SG was overall shorter than that in the CG. Furthermore, average age in the CG was notably higher than in the SG. This is explained by the fact that penile implantation sans priapism is commonly performed in older age groups, while priapism is not necessarily age related.

Among the limitations are: the bias due to subjectivity of patients' reporting on length and satisfaction, lack of a validated method for assessing satisfaction, and heterogeneity of the implant types, though none of the patients received a length expanding implant, so effect of implant type on length was similar for all cases.

CONCLUSION

Penile length shortly after ischemic priapism is comparable to that of full natural erection. Penile prosthesis implantation in this state -as per the erect length- was safe and offered higher satisfaction with length. It may be safe and favorable to implant prostheses as per the erect length in most other cases.

CONFLICT OF INTEREST

There are no conflicts of interest.

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