

Original Article

Long-term sexual activity status and influencing factors in men after surgery for hypospadias

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Abstract

The aim of this study was to compare the long-term postoperative status of hypospadiac patients by analysing their sexual psychology, sexual behaviour, sexual function and influencing factors. A total of 130 hypospadiac patients hospitalized between January 1988 and December 2007 were followed up with questionnaires using Zung's Self-rating Depression Scale (SDS), Self-rating Anxiety Scale (SAS), a self-designed sexual function questionnaire and a 5-item version of the International Index of Erectile Function (IIEF-5). The surveys served to evaluate the effects of hypospadias type, number of operations and surgical procedures on sexual psychology, sexual behaviour and sexual function. The control group consisted of 50 healthy adults. The postoperative SDS / SAS scores and occurrences of depression/anxiety in hypospadiac patients were significantly higher than those of normal controls ($P < 0.001$). Patients with proximal hypospadias and multiple procedures differed from those with distal hypospadias and a single procedure in all parameters of sexual psychology ($P < 0.05$). The average penile lengths and circumferences of hypospadiac patients under either erect or flaccid conditions were significantly shorter than those of normal controls ($P < 0.001$). A similar difference existed between patients with distal and proximal hypospadias ($P < 0.01$). There was no significant difference in any parameter of sexual function between patients with different numbers of operations and surgical procedures. Hypospadiac patients were clearly impaired in sexual psychology and penile development. The severity of hypospadias and number of operations were key factors that influenced the sexual psychology of patients. This finding indicated the importance of long-term follow-up and psychological counselling for hypospadiac patients postoperatively.

Asian Journal of Andrology (2009) 11: 417–422. doi: 10.1038/aja.2008.60; published online 20 April 2009.

Keywords: follow-up studies, hypospadias, psychosexual development, sexual behaviour

1 Introduction

Due to the difficulty of follow-up, the postoperative sexual status of hypospadiac patients has rarely

been investigated. Earlier studies [1, 2] have shown that hypospadiac patients are less sexually active postoperatively and are significantly impaired in both sexual psychology and social competence. However, there is some controversy regarding the outcomes [3, 4]. Mureau *et al.* [5] reported that the age at which surgery was completed is a key factor influencing sexual psychology. The effects of hypospadiac severity, number of operations and surgical procedures on sexual activity have not been investigated. Sexual status was investigated

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Received: 15 September 2008 Revised: 12 November 2008

Accepted: 28 December 2008 Published online: 20 April 2009

in 130 patients hospitalized in our medicine unit over the past 20 years using a detailed questionnaire designed to analyse the influencing factors.

2 Materials and methods

2.1 Patients and controls

A retrospective analysis was carried out to obtain clinical data pertaining to patients with hypospadias who underwent surgeries in our hospital between January 1988 and December 2007. A questionnaire was distributed for follow-up. In total, 180 questionnaires were mailed to the participants and 130 questionnaires were recovered. Of these 130 patients, 80 had distal (age at last surgery 6–22 years, median age 16.5 years) and 50 had proximal (age at last surgeries 3–26 years, median age 13.3 years) surgery. A total of 92 patients underwent a single procedure (age at last surgery 3–24 years, median age 12.5 years), and 38 underwent multiple procedures (age at last surgery 5–26 years, median age 15.6 years). The surgical procedures included pediculated flap urethroplasty (Duckett + Duplay, Duckett and scrotal island flap) and free graft urethroplasty (free internal preputial flap and bladder mucosa). Normal controls included 50 healthy adults (24–35 years old, median age 26.2 years). All subjects were sexually active adults at the time of follow-up.

2.2 Design of the questionnaire

The questionnaire included items to assess the patient's psychosexual condition, sexual behaviour and sexual function. Psychosexual condition was evaluated by Zung's Self-Rating Depression Scale (SDS) and Self-Rating Anxiety Scale (SAS) [6, 7]. The scores of the 20 items in the SDS and SAS were totalled and multiplied by 1.25. The nearest integer was taken as the standard score. An SDS standard score ≥ 53 indicated the presence of depression. An SAS standard score ≥ 50 indicated the presence of anxiety. Whether there were psychosexual factors that led to patients' depression and anxiety was investigated. Examples included fear of others laughing at their external genitals, feeling inferior due to hypospadias when they were with girlfriends, consideration that hypospadias or surgery affecting their male characteristics, and dissatisfaction with the size and appearance of external genitals. Investigations regarding sexual behaviour included questions regarding the age at which different sexual milestones were reached. Examination for sexual function

included the libido strength (scored as follows: very low, low, moderate, high, and very high; patients were given scores of 1–5), the length and circumference of the penis during erection or flaccidity, the penile erectile function according to a 5-item version of the International Index of Erectile Function (IIEF-5), the overall satisfaction with sexual life (very dissatisfied, dissatisfied, half-satisfied and half-dissatisfied, satisfied, and very satisfied; patients scored 1–5), whether the penis curved in a downward direction when erect, and whether there were ejaculation difficulties (spraying, dribbling, a delay in ejaculation or ejaculatory pain).

2.3 Instructions for penile measurement

In our study, the penile length and circumference of patients were measured by themselves. We gave them some standardized instructions for measurements along with the questionnaires. The instructions were as follows:

1) In a warm, quiet room, measurements must be made immediately after patients are undressed to minimize the effect of temperature.

2) Penile length is defined as the linear distance along the dorsal side of the penis extending from the pubopenile skin junction to the tip of the glans (not foreskin) measured by gentle placement of the end of a straight-edge ruler. The penile circumference is measured at the middle of the shaft by a soft ruler or a tape measure.

3) The erect penile length and circumference must be measured at full erection without using any pharmacological agents after a period of privacy and self-stimulation.

4) In order to reduce errors in measurements, two measurements should be performed at different times, and the mean should be recorded.

2.4 Statistical analysis

SPSS11.5 statistical software (SPSS, Chicago, IL, USA) was used. To compare two means, statistical analysis was carried out using the unpaired *t*-test. The χ^2 test was used for comparing incidences. $P < 0.05$ was considered statistically significant.

3 Results

3.1 Psychosexual examination

The postoperative SDS / SAS scores and occurrences of depression / anxiety in hypospadiac patients were significantly higher than those of normal controls ($P < 0.001$)

(Table 1). About 67% of the patients reported that they were inhibited when seeking girlfriends or sexual contacts. Only 7% of normal controls reported this concern. The patients reported they preferred not to talk about their sexual life because of penile appearance and the operation experience.

Further analysis of the psychosexual effects of hypospadiac severity, number of operations and different surgical procedures showed that there was a significant difference between individuals with distal and proximal types. There was also a difference between individuals with a single procedure and multiple procedures in SDS/SAS scores and incidence of depression

and anxiety ($P < 0.05$). There was no difference between individuals with different surgical procedures ($P > 0.05$) (Table 2).

3.2 Investigation on sexual behaviour

With the exception of spermatorrhoea, hypospadiac patients showed significant delay at the age of first-time masturbation, dating and sexual intercourse compared with controls ($P < 0.001$) (Table 3).

3.3 Examination of sexual function

There was no significant difference between hypospadiac patients and normal controls with respect to libido

Table 1. Psychosexual analysis of patients with hypospadias after surgery.

	Hypospadias ($n = 130$)	Controls ($n = 50$)	t/χ^2	P -value
SDS (mean \pm SD)	52.3 \pm 7.3	39.2 \pm 7.9	10.6	< 0.001
SAS (mean \pm SD)	48.9 \pm 7.7	38.2 \pm 5.3	9.1	< 0.001
Depression (n , [%])	52 (40.0)	1 (2.0)	25.1	< 0.001
Anxiety (n , [%])	56 (43.1)	2 (4.0)	25.2	< 0.001

Abbreviations: SAS, Self-rating Anxiety Scale; SDS, Zung's Self-rating Depression Scale.

The postoperative SDS / SAS scores and level of depression/anxiety in hypospadiac patients were significantly higher than those of normal controls.

Table 2. Psychosexual analysis of patients with hypospadias after surgery.

	SDS (mean \pm SD)	SAS (mean \pm SD)	Depression (n , [%])	Anxiety (n , [%])
Type				
Distal ($n = 80$)	50.9 \pm 7.1	47.6 \pm 8.0	26 (32.5)	28 (35.0)
Proximal ($n = 50$)	54.6 \pm 7.0	51.0 \pm 6.6	26 (52.0)	28 (56.0)
P -value	0.004	0.012	0.027	0.019
Number of operations				
Single ($n = 92$)	51.2 \pm 7.2	48.6 \pm 7.1	31 (33.7%)	34 (36.9%)
Multiple ($n = 38$)	55.7 \pm 7.2	52.9 \pm 8.6	21 (55.2%)	22 (57.9%)
P -value	0.001	0.003	0.022	0.028
Surgical procedure				
Free ($n = 84$)	52.5 \pm 7.8	50.1 \pm 8.0	33 (39.3%)	34 (40.5%)
Pediculated ($n = 46$)	52.5 \pm 6.9	49.5 \pm 7.3	19 (41.3%)	22 (47.8%)
P -value	0.967	0.643	0.822	0.418

Abbreviations: SAS, Self-rating Anxiety Scale; SDS, Zung's Self-rating Depression Scale.

Patients with proximal hypospadias and multiple procedures were significantly different from those with distal hypospadias and a single procedure in all parameters of sexual psychology. There was no such difference between individuals with different surgical procedures.

Table 3. Investigation of sexual behaviour in patients with hypospadias after surgery.

	Hypospadias ($n = 130$)	Controls ($n = 50$)	t -value	P -value
First-time spermatorrhea (age)	14.4 \pm 1.1	14.1 \pm 1.1	1.9	> 0.05
First-time masturbation (age)	20.1 \pm 1.5	17.9 \pm 1.3	9.2	< 0.001
First-time dating (age)	23.5 \pm 2.3	20.5 \pm 2.7	7.5	< 0.001
First-time sexual intercourse (age)	26.9 \pm 2.8	21.9 \pm 2.2	11.2	< 0.001

Data are expressed as mean \pm SD. With the exception of spermatorrhoea, hypospadiac patients showed significant delays in the age of first-time masturbation, dating and sexual intercourse compared with controls.

strength, overall satisfaction level of participants and partner in sexual activity, and erectile function ($P > 0.05$). On the other hand, the average penile lengths and circumferences of hypospadiac patients under both erect and flaccid conditions were significantly shorter than those of normal controls ($P < 0.001$) (Table 4). There was a significant difference between the distal and proximal types in erectile function ($P < 0.05$). There were also significant differences in the average penile lengths and circumferences ($P < 0.01$) under both erect and flaccid conditions. Patients who underwent different numbers of operations and surgical procedures did not show any significant differences in sexual functions ($P > 0.05$) (Table 5).

4 Discussion

An important measure, psychosexual condition, was used to evaluate the postoperative long-term therapeutic outcomes of hypospadiac patients. Compared with normal adults, hypospadiac patients showed marked psychosexual dysfunction. Their main dysfunction was depression and anxiety. These conditions occurred at a significantly higher level than normal controls. Earlier studies [5] have shown that the age at which surgery is completed is clearly associated with the occurrence of psychosexual dysfunction. Further analysis in this study disclosed that both hypospadiac severity and the

Table 4. Analysis of sexual function in patients with hypospadias after surgery.

	Hypospadias ($n = 130$)	Controls ($n = 50$)	<i>t</i> -value	<i>P</i> -value
Libido strength	3.2 ± 0.9	3.3 ± 0.9	1.3	0.192
Erectile function	22.2 ± 2.0	22.7 ± 1.1	1.6	0.115
Sexual satisfaction (participants)	3.4 ± 0.9	3.4 ± 0.7	0.2	0.839
Sexual satisfaction (partner)	3.0 ± 0.6	3.1 ± 0.5	0.6	0.523
Penile length (flaccid)	5.6 ± 1.0	8.5 ± 2.2	12.3	< 0.001
Penile circumference (flaccid)	6.0 ± 1.0	8.2 ± 1.7	10.3	< 0.001
Penile length (erected)	9.0 ± 1.2	12.9 ± 2.4	14.3	< 0.001
Penile circumference (erected)	8.1 ± 0.8	10.4 ± 1.7	12.4	< 0.001

Data are expressed as mean ± SD. The penile length and circumference were measured in centimetres. The average penile lengths and circumferences of hypospadiac patients under both erect and flaccid conditions were significantly shorter than those of normal controls ($P < 0.001$). There was no significant difference in other parameters of sexual function between patients and controls.

Table 5. Analysis of sexual function in patients with hypospadias after surgery.

	Libido strength	Erectile function	Sexual satisfaction		Penile size (flaccid, cm)		Penile size (erected, cm)	
			Participants	Partner	Length	Circumference	Length	Circumference
Type								
Distal ($n = 80$)	3.1 ± 0.9	22.3 ± 1.9	3.4 ± 0.9	3.1 ± 0.6	5.8 ± 1.1	6.3 ± 1.0	9.2 ± 1.2	8.2 ± 0.9
Proximal ($n = 50$)	3.2 ± 0.8	21.4 ± 2.0	3.5 ± 0.8	3.1 ± 0.9	5.2 ± 0.8	5.7 ± 0.8	8.7 ± 1.0	7.9 ± 0.7
<i>P</i> -value	0.785	0.020	0.474	0.558	0.001	< 0.001	0.016	0.035
Number of operations								
Single ($n = 92$)	3.2 ± 0.9	22.0 ± 2.1	3.5 ± 0.9	3.1 ± 0.6	5.6 ± 0.9	6.1 ± 1.0	9.1 ± 1.1	8.1 ± 0.9
Multiple ($n = 38$)	3.1 ± 0.8	21.4 ± 1.7	3.2 ± 0.9	2.9 ± 0.5	5.6 ± 1.2	5.9 ± 1.0	8.9 ± 1.3	8.0 ± 0.7
<i>P</i> -value	0.850	0.108	0.129	0.145	0.754	0.493	0.699	0.447
Surgical procedure								
Free ($n = 84$)	3.1 ± 0.9	22.1 ± 2.1	3.4 ± 0.9	3.1 ± 0.6	5.6 ± 1.0	6.0 ± 1.0	9.1 ± 1.1	8.1 ± 0.8
Pediculated ($n = 46$)	3.3 ± 0.8	22.4 ± 1.8	3.4 ± 0.8	3.0 ± 0.6	5.6 ± 1.1	6.1 ± 0.9	9.0 ± 1.2	8.0 ± 0.8
<i>P</i> -value	0.294	0.368	0.838	0.584	0.948	0.879	0.673	0.385

Data are expressed as mean ± SD. The penile length and circumference were measured in centimetres. There was a significant difference between distal and proximal types of hypospadias in erectile function, average penile length and circumference under both erect and flaccid conditions. Patients who underwent different numbers of operations and surgical procedures did not show any significant difference in sexual function.

number of operations had similar psychological effects. The more severe the hypospadias and the greater the number of operations, the more significantly the patients were impaired in sexual psychology. Their depression and anxiety presented mainly because of dissatisfaction with their external genitals. A total of 55% of the proximally hypospadiac patients, and 43% of those with multiple operations, were very dissatisfied with the appearance and size of their penis. Their complaints included decreased length, marked surgical scars and abnormal-shaped glans. These patients worried about being mocked by friends because of the appearance of their external genitals. This resulted in inhibition and inferiority when looking for sexual partners. These findings were consistent with earlier studies [8, 9]. Moreover, both pediculated flap urethroplasty and free graft urethroplasty had fewer effects on psychosexual dysfunction. Any procedure that reconstructs a near-normal external urethral orifice, completely corrects the penis curvature, produces an acceptable appearance of the penis and has few complications would be favourable.

Regarding sexual activity, hypospadiac patients had their first spermatorrhoea at an average age of 14.3 years. This indicates that hypospadias does not affect sexual maturity. However, the ages of first dating, sexual intercourse and masturbation were delayed compared with normal controls. Also, patients were not willing to talk about issues relating to sex. Similar to Svensson and Berg and their colleagues [10, 11], we found that hypospadiac patients have suppressed their sexual psychology. Thus, it is of great importance to offer proper counselling to hypospadiac patients.

In the study by Avellán [12], 121 hypospadiac patients were investigated. He found the median age for sexual debut in hypospadiacs to be 16.9 years. Controls had a median age of 16.6 years. The sexual activity and sexual function of hypospadiacs were normal. Our study showed that patients did not significantly differ from normal controls at adulthood in libido strength or overall satisfaction with sexual life. No significant difference was observed between patients with different types of hypospadias or different numbers of operations and surgical procedures. This finding indicates that hypospadias and surgical trauma did not alter the overall sexual function of patients. Even in those with a smaller penis, dyspareunia rarely occurred. This was consistent with the findings in recent literature [13–15].

The investigation of sexual function showed marked retardation in penile development. At adulthood, the average penile lengths and circumferences of hypospadiac patients under both erect and flaccid conditions were significantly shorter than those of normal controls. We consider that the age at which surgery was completed may be an important factor influencing penile development to some extent. The reported effects of hypospadiac severity on penile development have varied among studies [16, 17]. This study showed that proximally hypospadiac patients had a decreased average penile length compared with distally hypospadiac patients. The more severe the hypospadias, the more impaired the penile development. This was probably because of the presence of undescended testes, a lower level of androgens, more surgical trauma, incomplete correction of penis curvature and complications. Multiple procedures did not determine penile development. However, they did alter penile appearance. A key measure of sexual function and penile erectile function did not differ between hypospadiac patients and normal adults. However, proximally hypospadiac patients differed significantly from distally hypospadiac patients in erectile function. Those proximally hypospadiac patients complained more of downward curvature during penile erection and erectile pain. These complaints were due to incomplete correction of the penis's curvature or excessive scarring. In addition, similar to previous studies [18, 19], ejaculation difficulties occurred more frequently in proximally hypospadiac patients than in distally hypospadiac patients (33% vs. 17%). These difficulties presented as spraying, dribbling or delay in ejaculation. These problems were probably because of a higher occurrence of postoperative urethral strictures, diverticulae, insufficient support of the spongiosum tissue in the re-constructed urethra, or abnormal development of the prostate and seminal vesicles [15, 20, 21].

In summary, adult hypospadiac patients differed significantly from normal controls in sexual psychology and certain aspects of sexual function. Hypospadiac severity and number of operations were critical factors. For improvement in long-term therapeutic outcomes, it is important to choose rational surgical procedures, minimize the number of operations, prevent complications, perfect postoperative penile appearance, and offer postoperative long-term follow-up and psychosexual counselling.

Acknowledgment

This work was supported partly by Science & Technology Planning Program from Guangdong Province, China (2007B030502008).

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