The Sexual Function After Early Penile Reconstruction

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The need for a long view

When a male infant is born with an abnormal penis current teaching is that reconstruction should be performed as early as possible. The pediatric surgeon and the parents will be pleased when the boy's penis looks like that of his peers. Little thought is then given to the sexual function in adult life and he is usually discharged after a short period of follow up. It is only when the penile deformity is a part of a major anomaly such as exstrophy, that medical care goes on into adult life.

There is, therefore, considerable difficulty for the clinician in discovering what the long term outlook will be. In conditions where the patient is discharged early in childhood, he will only be seen again if he presents with a sexual difficulty or other complication. This may give the false impression that sexual difficulties are common.

When the patient remains under medical supervision into adult life, a more balanced view of the sexual function can be formed. Judging from this type of patient, the overall sexual and reproductive function of patients with abnormal genitalia is surprisingly good. The outcome is particularly satisfactory if the children are brought up to believe that they are normal human beings rather than freaks who can never hope to have a normal adult social life. Doctors, parents and school teachers must all play their part to achieve this result.

In the case of boys who have undergone early penile surgery, there are two conditions that illustrate the opposite ends of this spectrum: hypospadias and exstrophy/epispadias.

Hypospadias

Most of the patients who are now seen as adults are likely to have been operated on with techniques that have largely been abandoned, relatively late in childhood and in two or more stages. If the sexual function in adult life is dependent on a good cosmetic result, we might assume that there will be better results from the current single-stage repairs performed in infancy.

In assessing overall sexual function in hypospadias, a number of factors need to be considered:

1. Can the man have satisfactory penetrative intercourse?
2. Does he ejaculate?
3. Are his hormones normal?
4. Is he fertile?
5. Does he have psychosexual problems?

The answers to these questions appear to depend on:

1. The original severity of the hypospadias.
2. The success of the surgical repair, though probably not on the type of repair.
3. Age at completion of surgery.
4. Whether the observed results are based on all patients in a series or only on those who responded to a specific recall for review.
5. The coincidence of other conditions such as sexual ambiguity or testicular anomalies.

Penetrative intercourse

All reported series record that most men claim to have normal intercourse. It is not always possible to decipher a precise figure from the published data, nor to discover the quality or quantity thereof. Figures for successful intercourse range from 77% to 90%. The mean age of sexual debut is given as 16.9 years in Sweden (normal 16.6) and 17.3 or 18.0 in the U.K. [1,8,13,15].

Success of the repair

Reports of cosmetic success appear to depend very much on the interests of the assessor. Surgeons reviewing their own cases give impressive results. In a personal series of Denis Browne repairs reviewed at a mean age of 18.4 years old, it was reported that all of 220 men had a straight erection, a formed stream and a normal flow rate [13]. However, only 76 had a terminal meatus; in 133 it was in the coronal sulcus and in 11 proximal to the sulcus. In other words 65% had a hypospadias that, had it been a primary case, would still have required surgery by todays standards.

Summerlad, making an independent review of 60 patients (Denis Browne repair: 30, Ombrédanne: 24, meatotomy: 6), emphasised this observer variation. The meatus was rarely at the tip of the penis and 22% had residual chordee even when flaccid [20].

It is interesting to find, however, that in all series intercourse only seems to be prevented by fairly gross surgical failure. The commonest cause is pain from persistent chordee [8,15,20].

Johanson and Avellan describe a group of boys whose "curative" repair was delayed beyond the age of 12 years. Although the sexual results in this group were less good than in those having an earlier "cure", 50% had their sexual debut before their final surgery [13].

Degree of original hypospadias

The worse the original problem, the worse the long term results. In the case of sexual function this is a fairly universal observation. A poor surgical result is commoner with severe degress of hypospadias which leads to sexual difficulties [8,10].

Both penile hypoplasia and sexual ambiguity are associated with severe hypospadias. The more proximal the original meatus, the shorter the erect length of the adult penis, with coronal cases being normal and peno-scrotal cases being about a third shorter than normal [8]. Both of these problems are associated with poor sexual function [8,10,20]. Conversely, in patients with the meatus on or distal to the shaft, 66% of young males are married even though many have residual penile problems [11].

Ejaculation

The quality of ejaculation is difficult to measure. Few patients have the comparative experience that might be helpful. The first stage of ejaculation is the formation of a bolus of semen in the prostatic urethra. It is expelled by a combination of prostatic and bulbospongiosus muscle contraction. These components should both be normal except in the most severe hypospadias. A patulous or a stenosed distal urethra may be associated with less forceful ejaculation [17,20].

Most authors report "normal" ejaculation. However, where specific questions have been asked, Bracka found that 33% had "dribbling" and 4% had dry ejaculation [8].

Hormones and fertility

In uncomplicated cases of hypospadias it seems likely that hormonal function is normal. In an unselected series of 213 patients recalled for review, hormonal profiles were only measured on the first 100 because they were always normal [8]. Other series have found hormone abnormalities chiefly when hypospadias was a part of a more complex sexual ambiguity. However, in Gearhart's series of 16 adult patients the mean levels of FSH and LH were higher than normals but still in the normal range. Five had grossly abnormal androgens although three were fertile [11]. Low levels of 5-α reductase were reported by Berg et al [6].

There have been no studies to address the question of fertility. It seems probable that otherwise normal boys with hypospadias have normal fertility. However, one series reported that 50% of unselected patients had abnormal semen analysis [27]. In discussing fertility with patients it is important to remember that it is a hereditary condition. In a prospective series of 430 patients there was a 21% incidence of hypospadias in another family member [2].

Sexual ambiguity

When hypospadias is part a complex of sexual ambiguity, the late outcome is poor. All series include, amongst their least sexually successful patients, those with other developmental problems. In Bracka's series 25% of patients had "infertile semen"

but most had other anomalies [8]. It is particularly emphasised by Marberger in whose series there were 13 with sexual ambiguity, 11 of whom did not have intercourse and all had azoospermia [10].

Psychological results

Several authors have suggested that there might be psychological consequences from hypospadias or from its treatment. There have been few formal studies of adults.

Summerlad found that 20% of patients appeared to have suffered from their several admissions. Twenty one of 60 patients avoided changing in public and 31 admitted to anxieties during adolescence, mainly about sexual function and fertility. Forty three thought that their penis was abnormal. Two patients who could not be interviewed (and are not part of the series) were in prison, both for sexual offences [20].

Very similar views were expressed by Bracka's patients 74% of whom felt that they had had "inadequate guidance" on sexual function. Forty percent said that it had affected their personal relationships [8]. This did not stop 77% claiming to have satisfactory intercourse. There were no controls in these series and it may be that we are seeing the general adolescent anxiety about sexual development.

A very extensive psycho-analysis has been made of 33 men who were operated on for hypospadias as children. Thirty six men who had had an appendicectomy in the same hospital, at the same time and at the same age were investigated as controls. There were no significant differences between the groups in general health, I.Q. or socio-economic background. Obviously there was considerable difference in the type and number of operations that they had undergone although the details are not given. The analyses were made without knowledge of the patients diagnosis.

The patients who had hypospadias fared badly. They had lower ego strength and poor utilisation of mental resources. They had reduced capacity for social and emotional relationships. Their levels of hostility, general anxiety and castration anxiety were higher and they had lower self-esteem. The severity of these abnormalities was not related to the original severity of the hypospadias.

In childhood the patients had been shy, timid, isolated and mobbed. As adults they were prone to neurotic (but not psychotic) disturbances and abnormal social relationships. They were less secure in their gender identity, had delayed sexual debut and a smaller number of sexual partners. Eventually they settled down in secure and lasting sexual partnerships. The modern jargon for such men might be "under-achievers". In the long run, they had less rewarding and less demanding jobs [3,4,5,6,7,21].

These studies are open to several criticisms [25]. In particular, the controls were not remotely similar, the authors anticipated the psychological morbidity and set out to prove it and the majority of patients had not had a good surgical result. Nonetheless, these are very detailed and important studies and their results cannot be dismissed without proper thought. Similar comments are found in the series of Eberle et al, though without such a detailed protocol [10]. If patients treated for hypospadias have psychological problems we should seek the reasons and try to correct them.

It is tempting for surgeons to be sceptical of psychological theories when there is a clear cut anatomical problem. It does seem most likely that successful single-stage surgery will give better long term results. I think it would pay to keep an open mind and, at least, to provide proper counseling for the parents until we know the long term results of the new techniques.

Epispadias

The sexual consequences of epispadias, with or without exstrophy should be fairly obvious:
the penis is rudimentary.

Adult males with exstrophy and epispadias typically have a short broad penis. When seen in the flaccid state it certainly does not "dangle". Its shortness is emphasised by the normal size of the scrotum and the recession of the lower abdominal wall (Fig. 1).

The severity of the exstrophy deformity and the obvious shortness of the penis have, in the past, obscured the erectile deformities that are more of a bar to penetrative sexual intercourse. To understand the sexual consequences of epispadias, it is necessary to understand some of the complex pelvic anatomy.

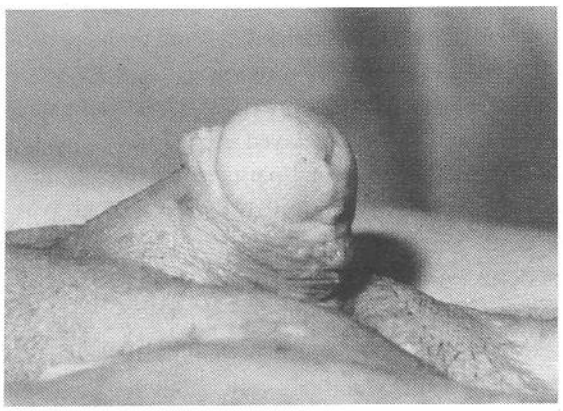

Figure 1. Clinical photograph of a typical penis in exstrophy. Note good calibre, short length and lack of dangle.

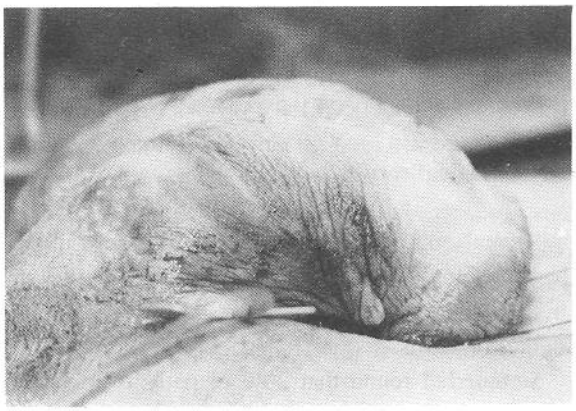

Figure 2. Clinical photograph of an artificial erection in an exstrophy patient. Each corpus has been infused separately as there is no cross circulation in exstrophy. There is tight dorsal chordee.

The orientation of the inferior pubic rami and the attachments of the deep parts of the corpora are unlike those of normal males. Studies of cavernosograms have shown that the symphysis is not only open but the pelvis is rotated caudally so that the inferior pubic ramus is parallel to the floor when the patient is standing [26].

However, the shortness of the penis is not, as might be thought, due to the open symphysis causing most of the penis to be buried in the perineum. The corpora are actually deficient in length although of normal calibre [26].

These anatomical findings have important implications for any proposed penile lengthening procedure. Firstly, no dissection posterior to the junction with the pubic body will give any penile lengthening. Secondly, the suggestion that the corpora could be completely detached from the inferior pubic rami and pulled forward seems a theoretically dangerous procedure because of the risk of devascularising or denervating the corpora [14].

Dorsal chordee on erection is an integral part of the exstrophy/epispadias complex. It is found consistently in all uncorrected patients (Fig. 2). The degree is variable, but in most it is a significant handicap to sexual intercourse.

A more complex deformity occurs when one or both of the corpora are abnormal. If one corpus fails to fill on erection it acts as a "bow-string" on the other and causes lateral deviation in addition to the dorsal chordee.

If both corpora are rudimentary, the visible or exophytic part of the penis is normal except that it is a little higher than usual on the abdomen. On cavernosography the corpora appear to have no attachment to the pubic rami. Erection is very limited and the penis unstable. It seems probable that the rudimentary corpora are caused by damage during reconstructive surgery in infancy [9,26].

When these erectile abnormalities were first described they were common in young adult patients [23]. The distribution of deformities is shown in Table 1. They have now become much less common. It seems likely that modern techniques of reconstruction in infancy correct the chordee. Awareness of the risks of damage to the corpora have largely eliminated the complex deformities [19].

The techniques for correction of the anatomical abnormalities have been described elsewhere [25].

Male exstrophy babies should have the corrective surgery incorporated in their initial reconstruction. When this is not achieved (or in the older patients), the erectile deformity should be assessed at the end of puberty and corrected.

Without surgical correction of the dorsal chordee, penetrative intercourse is almost impossible. Many patients prefer to lie supine and have their female partner sit on top with the vagina covering their penis. This brings the penis into the closest possible

Table 1. Incidence of erectile deformities in exstrophy and epispadias

Dorsal chordee	77 %
Unilateral rudimentary corpus	9 %
Bilateral rudimentary corpus	14 %

apposition with the vagina. After correction, although the penis remains short, most men are able to have limited vaginal penetration.

The men appear to have a normal libido. They have fewer casual sexual partners than would be expected. They form very stable partnerships with normal girls and have normal family life. In my own series 33 of 43 for whom full information is available have been married or lived with a partner.

In an early review of adult patients all but two of 31 patients ejaculated [12]. In another series 16 of 25 patients had ejaculation but its quality was not recorded [19]. Absence of ejaculation is rare in spite of the more extensive reconstructions that are done, but the emission that does occur is slow and may continue over several hours after orgasm. Some patients describe a more or less continuous urethral discharge of semen-like fluid.

Although the genital tract up to the verumontanum is normal, there is a high incidence of poor or absent sperm.From my own patients and those reported in the literature about half the men who wish to do so are unable to father children.

The main cause of infertility appears to be repeated prostatic and bladder infections. Thus, ironically, the boys who underwent early urinary diversion have the best record for fertility.

Conservative treatment of inadequate genitalia

The question arises how abnormal do the genitalia have to be before sexual function appropriate to genetic sex becomes impossible?

The problem in the apparent male with inadequate genitalia is difficult. It has been suggested that male infants with grossly inadequate genitalia should have an early gender re-assignment. This is particularly recommended in cloacal exstrophy and where a small penis fails to achieve 2 cm of stretched length 1 month after administration of 50 mg testosterone i.m. [16,18]. Cases have been cited where refusal of such advice by the parents has resulted in poorly adjusted adolescents who commit sexual offences [18].

There is no doubt that a good female appearance can be produced, but long-term follow up is lacking. In particular, it is not known whether the XY infant re-assigned to female in infancy grows up to be a sexually adequate female.It is quite possible that they make as unsatisfactory sexual females as they would have made males.

My own experience is that men with the smallest and most deformed penes can have a satisfying sexual relationship with their partner.

A study of adults with small or micro penis has established that sexual function is normal in 75% of patients. In 12 adult patients with micropenis from a variety of causes it was established that all functioned as normal men. They had male orientated jobs, hobbies and sports. They had normal gender identity and all had heterosexual inclinations. Nine were married or had a regular female partner, usually of long standing. One man had a wife and a mistress [22].

Although this survey lacks supporting data from the literature it does give some indication that even with a very small penis normal male sexual function is possible. Children with abnormal external genitalia should be supported in the view that normal sexual intercourse will be possible in adult life. Adult sexual difficulties in these patients are far more likely to have a psychological than an anatomical cause. If there are erectile deformities that can be corrected, surgery is appropriate. However, penile surgery is unlikely to be useful for psychological problems.

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