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MINI-REVIEW

Buried penis



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KEYWORDS

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Abstract Buried penis is a congenital anomaly in which the penis is normal in size but appears to be small (i.e., the external genitalia appear small). This anomaly is usually associated with inadequate outer penile skin, fibrosis of the Dartos fascia, inadequate subcutaneous attachment to Buck's fascia, and narrow opening of the prepuce. Various systems have been used to classify this anomaly and its related conditions. Several symptoms such as difficulty maintaining hygiene and holding the penis during voiding, balanitis, urinary tract infection, and embarrassment when naked have been reported. Adults may present with painful erection, sexual embarrassment, and difficulty with vaginal penetration. Several surgical techniques have been developed to correct this anomaly. Most studies have suggested early surgery. Accurately diagnosing the anomaly and avoiding circumcision are crucial in these patients.

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1. Introduction

Buried penis is a congenital anomaly in which the penis is normal in size but appears to be small (i.e., the external genitalia appear small). Parents of patients with this anomaly or patients themselves visit hospital because of the small appearance of the penis. In addition to the abnormal appearance, symptoms may be present, requiring medical assistance. This problem exerts negative psychological

effects on some adolescents and their parents. The incidence of the buried penis anomaly has not been thoroughly studied, although Matsuo et al¹ reported a prevalence of 3.7% in Japanese newborn infants. Moreover, evidence regarding whether the buried penis anomaly is mitigated with age is unavailable. Different opinions regarding various aspects of this anomaly have been reported. This review summarizes various opinions from previous studies.

2. Nomenclature

The nomenclature used to describe this condition is ambiguous. Different terms have been used to describe similar conditions. The following are some of the terms that have been used to describe buried penis and its related

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conditions. Buried penis is described as a congenital anomaly in which the penis is normal in size but is hidden beneath the prepubic skin and fat. This anomaly is usually associated with inadequate outer penile skin, inadequate subcutaneous attachment to Buck's fascia, and narrow opening of the prepuce (Figure 1).² Concealed penis,³ inconspicuous penis,⁴ and congenital megaprepuce⁵ have been used to describe conditions similar to buried penis. However, Shenoy and Rance⁶ suggested that congenital megaprepuce is a separate entity. The trapped penis condition is usually a result of inadequate circumcision.

3. Classification

Several classification systems have been used to describe buried penis and related conditions; nevertheless, none of such classification systems has been universally accepted. Maizels et al⁷ used the terms concealed (before circumcision), trapped (cicatrical after circumcision), and buried (associated with adolescence and obesity) to differentiate various etiologies. Casale et al⁸ categorized cases into Type 1 (congenital concealed penis), Type 2 (concealed penis because of scarring from a previous surgery), and Type 3 (complex cases involving excessive obesity). These two systems have been commonly used and included both congenital and acquired problems. Chin et al² focused on patients with congenital buried penis and classified them into three groups, A, B and C, according to the ratio of the length of the penile skin to that of the penile shaft (S/P ratio). Patients in Groups A, B, and C had severe, moderate, and mild or no deficiency of the penile skin, respectively (S/P ratio: < 30%, 30–70%, and > 70%, respectively); however, Group C patients had a thick prepubic fat layer. This classification indicated the severity of the anomaly and the need of surgery in different groups.

4. Etiology

Various etiological factors have been proposed to explain buried penis. The penis usually has a normal anatomy, but it is tethered and shortened by abnormal fibrous bands



Figure 1 Typical appearance of buried penis.

connected to the Dartos.⁹ Spinoit et al¹⁰ observed abnormal histology of the Dartos fascia in 74% of patients with buried penis. Hence, the Dartos layer becomes nonelastic, prevents forward extension of the penis, and holds it buried under the pubis. Furthermore, a thick prepubic fat layer aggravates the symptoms. However, no study has reported an abnormality in the hormone system in this condition.

5. Diagnosis

Although buried penis can be diagnosed through inspection, several other conditions have a similar appearance. The size of the phallus is normal in buried penis, whereas an actual small penis can be diagnosed as a micropenis. Micropenis is defined as a stretched penile length of less than –2.5 standard deviations of the mean penile length of patients in the same age group. Micropenis can be caused by structural or hormonal defects in the hypothalamic–pituitary–gonadal axis. In addition, it can be observed in certain congenital syndromes.¹¹

Other differential diagnoses include hypospadias, obesity, and congenital adrenal hyperplasia in females and other chromosomal abnormalities.

6. Symptoms

Buried penis is more commonly observed in infants and prepubertal boys. Most patients with buried penis seek medical consultation for the small appearance of the penis. Older children may have difficulty maintaining hygiene, resulting in repeated balanitis and urinary tract infection. Some patients also experience difficulty holding the penis during voiding and embarrassment when naked with peers. Some patients have ballooning of the foreskin with voiding and may be frequently wet if voiding into the preputial sac (megaprepuce) occurs.

Some patients with buried penis were circumcised when they presented at clinics. Casale et al⁸ reported that 56% of their patients had previously undergone penile surgery, and almost all of them underwent circumcision. In addition, Bergeson et al¹² reported that 42% of their patients underwent circumcision. Because inadequate circumcision complicates further surgical correction in patients with buried penis, it is crucial for the primary care physician to diagnose this condition and avoid circumcision without careful consideration.

Adults may present with painful erection, sexual embarrassment, and difficulty with vaginal penetration.¹³ Some may have difficulty voiding in a standing position and may soil themselves while urinating.

7. Management

In general, procedures used to correct the buried penis anomaly include degloving the penis, dissecting the skin and subcutaneous tissue from the corpora, releasing any band of dysplastic tissues tethering the penis, and reconstructing the penile skin. Several researchers have emphasized the importance of fixing the penile skin to the pubis or Buck's fascia.² The removal of excess subcutaneous

fat may be helpful in some obese patients³; however, it has rarely been performed in children.

Numerous surgical techniques have been developed to correct this condition. Glanz¹³ and Kubota et al¹⁴ have used multiple Z-plasties to correct the anomaly. Crawford¹⁵ described the release of tethering bands from the Dartos through an S-shaped skin incision on the dorsum of the penis. Wollin et al¹⁶ corrected the sparse ventral shaft skin by using an island pedicle flap from the inner prepuce. Donahoe and Keating¹⁷ described preputial unfurling to cover the shaft after releasing the penis from tethering. In addition, Chin et al² reported a modified preputial unfurling technique with satisfactory results. Johnson¹⁸ anchored the suprapubic skin to the pubis to ensure the length of the exposed dorsal penile skin, whereas Horton et al¹⁹ suggested removing the excess suprapubic fat as an essential procedure in some obese patients.

Although early surgery has been suggested, evidence regarding whether the buried penis anomaly resolves with age is unavailable. Maizels et al⁷ and Wollin et al¹⁶ emphasized the negative social and psychological effects of this anomaly during childhood and therefore recommended early surgical treatment. Casale et al⁸ suggested that the anomaly should be corrected immediately after the affected children start walking, when the children's abdominal fat has diminished. Philip and Nicholas²⁰ corrected the anomaly immediately after the diagnosis to resolve both dysuria and cosmetic problems. Herndon et al²¹ reported that corrections were more successful in toddlers and less successful in adolescents. As the penile length increases, the prepubic fat accumulates, and more frequent erections and surgical corrections in adults are generally considered to be more difficult.²² Surgical management in young boys is essential for satisfactory treatment; therefore, an accurate diagnosis and early referral by primary care physicians are crucial.

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