Scrotal reconstruction using tissue expanders

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Tissue expansion has been used successfully for reconstruction following many congenital and acquired deformities. This report outlines the use of tissue expansion for reconstructing the scrotum in a pseudohermaphrodite with undescended testes and a hypoplastic scrotum. Tissue expanders were placed in the scrotum to create space for the testes. Relative to other reconstructive options in the scrotum, tissue expansion resulted in an excellent cosmetic appearance with the advantage of providing the desirable space for the testes with no donor site morbidity.

Key Words: Scrotum; Tissue expansion

Reconstruction du scrotum au moyen de dispositifs d'extension tissulaire

RÉSUMÉ: La technique d'extension tissulaire est utilisée avec succès dans la reconstruction de nombreuses difformités acquises ou congénitales. Le présent rapport fait état de l'utilisation d'un dispositif d'extension tissulaire visant à reconstruire le scrotum chez une personne pseudohermaphrodite aux testicules non descendus et avec un scrotum hypoplasique. Les dispositifs d'extension tissulaire ont été placés dans le scrotum pour créer un espace pour les testicules. Par rapport aux autres méthodes de reconstruction du scrotum, l'extension tissulaire a donné d'excellents résultats d'un point de vue esthétique avec l'avantage de fournir l'espace désiré pour les testicules sans morbidité au site du donneur.

The reconstruction of scrotal skin following trauma, infection or congenital anomalies of the genitalia often poses great difficulty for the plastic surgeon. The bacterial flora of the area, the peculiar anatomy of the male genitalia and the need for maintenance of testicular function in a normal, thermoregulatory space narrow the reconstructive alternatives and make aesthetic scrotal reconstruction difficult.

Tissue expansion has been used successfully for reconstruction following many congenital and acquired problems (1-4). It has the advantages of providing healthy tissue, causing only minor donor site morbidity and improving aesthetic results. We present a case of a hypoplastic scrotum in a pseudohermaphrodite child with cryptorchidism and describe an alternative method of scrotal reconstruction by using two soft tissue expanders for the purpose of creating space for the testes.

CASE PRESENTATION

This extremely interesting four-year-old child was born prematurely with significant ambiguity of the genitalia. The penis was very short, with a completely dysplastic scrotum, severe perineal hypospadias and ectopically palpable gonads outside the external inguinal ring. There was no evidence of any mullerian duct derivatives. The karyotype was assessed to be 46XY, and after complete investigation, the child was found to be a male pseudohermaphrodite.

After considerable debate among the Division of Urology and Endocrinology at The Hospital for Sick Children, Toronto, Ontario, it was decided that the child would be raised as a male, on the basis of a positive response to testosterone and the size of the phallus and male karyotype. The child underwent extensive reconstruction of the genitalia and presented with a hypoplastic scrotum to accommodate the

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Figure 1) Hypoplastic scrotum, before the insertion of tissue expanders in a four-year-old child with significant ambiguity of the genitalia



Figure 3) Reconstructed scrotum with testes in a four-year-old child with significant ambiguity of the genitalia



Figure 2) Custom made tissue expanders ready for insertion in a four-year-old child with significant ambiguity of the genitalia



Figure 4) Palpable testes in the scrotum in a four-year-old child with significant ambiguity of the genitalia

undescended testes (Figure 1). Although bilateral orchidopexy was performed in the past, because of the virtually nonexistent scrotum, the testes had migrated back into the inguinal region. It was elected to proceed with tissue expansion of the scrotum to provide room for the testes, which would then be brought down into the scrotum at a subsequent procedure.

Under general anesthesia, skin incisions were made over the pubic tubercle on both sides and a tunnel was created subcutaneously to allow passage of the expanders into the scrotal sacs. The tissue expanders were custom made, both low profile, with dimensions $2 \text{ cm} \times 2 \text{ cm} \times 1 \text{ cm}$ (Figure 2). The injection ports were placed just over the bony pubic tubercle. Drains were not used, and the subcutaneous tissue and skin were closed in layers.

There was moderate, postoperative swelling, but the child had little discomfort and was discharged the third postoperative day with no problems. Expansion began two weeks after expander insertion, with weekly percutaneous injections of about 1 mL to 2 mL of saline into each port. The expansion was completed uneventfully in two months, and the patient was readmitted for the second procedure.

Under general anesthesia, the expanders were removed and bilateral orchidopexy was performed. At the termination of the procedure, both testicles were accommodated comfortably in the scrotum, without tension, and with a satisfactory, cosmetic result.

There were no postoperative problems. Late follow-up demonstrated an adequate scrotum with two healthy, palpable testes (Figures 3,4).

DISCUSSION

Tissue expansion has become the treatment modality of choice for many defects. In the pediatric population, it has greatly facilitated reconstruction of a wide variety of problems (5,6). Our application of tissue expanders for the scrotum was very successful, and, although it required a two-stage procedure, the final result was worthwhile.

Traditionally, reconstruction of the scrotum following trauma, burns and infectious or other genital anomalies involves use of local flaps or skin grafting (7-10). Numerous

techniques have been described but usually result in unsatisfactory cosmetic appearance, despite multiple or staged procedures. Tissue expansion for scrotal reconstruction has been described in the case of an avulsion injury of the scrotum, using expansion of the residual perineal skin. The results in this case were reported as very acceptable (11).

The necessity for reconstruction of a hypoplastic scrotum arises in cases of major congenital anomalies of the genitalia or during a surgical sex conversion (12). These conditions are quite rare, especially scrotal reconstruction in cases of congenital anomalies of the genitalia because very few have been reported in the literature.

In this pseudohermaphrodite child, tissue expansion of the scrotum was carried out to accommodate the undescended testes. Following tissue expansion, the child underwent extensive multistaged reconstruction of his genitalia for correction of his severe hypospadius and other associated urinary problems. Although the final reconstruction in the patient's genitalia seems to be very complex and difficult, the application of tissue expanders for the reconstruction of his hypoplastic scrotum was successful and this procedure was relatively easy. No complications were encountered, and relative to other methods for scrotal reconstruction, there was considerably less scarring and an improved aesthetic result.

CONCLUSIONS

The present case report outlines the management of a severe hypoplastic scrotum in a pseudohermaphrodite child with the use of tissue expansion. Relative to other reconstructive options, this method has numerous advantages and relatively few disadvantages, and should be considered as a valuable treatment modality in scrotal reconstruction for congenital anomalies of the genitalia.

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