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Case Report

Vaginoplasty with a Pudendal-Thigh Flap in Intersexuals

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We treated 2 different types of intersexual patients who underwent a vaginoplasty with the pudendal-thigh flap. One was a female with testicular feminization syndrome for whom we reconstructed the total vagina with a pudendal-thigh flap, and the other was a female with an adrenogenital syndrome for whom we enlarged the introitus of the vagina with the same approach. There were no complications such as a flap necrosis. In addition, there was no stricture of the neo-vagina and no urinary problem.

Key words: vaginoplasty, intersexual, pudendal-thigh flap

To date, many procedures have been reported for vaginoplasties in intersexual patients, such as the McIndoe procedure [1], the perineal flap [2] and the buttock flap [3]. However, all of these procedures have disadvantages. We have performed vaginoplasties in many male-to-female transsexual patients with the modified pudendal-thigh flap and have found it to be a valuable flap free from complications [4]. The advantages of the pudendal-thigh flap are that it can be elevated safely while retaining good vascularity, it provides for the construction of a sufficiently deep vagina without a skin graft and the donor scar is not so remarkable. Herein we report 2 different types of intersexual patients who underwent vaginoplasty with the pudendal-thigh flap.

Case Report

Case 1, 29- old woman with a testicular feminization syndrome. This patient consulted our department for a vaginal reconstruction. She had already started female hormonal therapy and revealed normal breasts, hardly any axillary or pubic hair growth, adhesion of the bilateral labia, no introitus of the vagina and no palpable uterus or adnexa. At an additional examination, the uterus and adnexa proved to be absent, the serum testosterone concentration was substantially increased and the karyotype was 46, XY. The patient had undergone a bilateral inguinal hernia operation and the testicles were extirpated in childhood.

M-shaped bilateral pudendal-thigh flaps were designed and were elevated above the medial thigh fascia including the posterior pudendal vessels and nerves to ensure the survival of the flap and its sensitivity (Figs. 1, 2). The cavity for the vagina was created in the space between the prostate and rectum. For this part of the surgery, finger dissection is considered to be the easiest and most reliable method. We introduced one index finger into the rectum and dissected with the other index finger. We constantly confirmed the thickness between the cavity and rectum with both index fingers to ensure lack of injury to the rectum (Fig. 3). The depth of the cavity was almost

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Fig. 1 Design of the pudendal-thigh flap and the incision line for the labial flap.

Fig. 2 Elevation of the pudendal-thigh flap.

Fig. 4 Completed cavity for the vagina.

10 cm (Fig. 4). The edges of the bilateral pudendal-thigh flaps were sutured together to form a pouch lining the vaginal cavity (Fig. 5). The top of the pouch was fixed at the bottom of the cavity with 2 anchor sutures. The adhesive labia were cut about 3 cm in the midline and the labial flaps of both sides were fixed at the bases of the M-shaped flap (Fig. 6). There appeared to be no need to retain any implement, such as a prosthesis, in the vagina and we this usually inserted only isodine-soaked gauze into the cavity. The urethral catheter and the drains were removed within 5 days of the operation. Sexual activity was permitted and vaginal dilation with a dilator was started within 3 months of the operation. There was no stricture of the neo-vagina and no urinary problem 1 year after the operation (Fig. 7).

Fig. 3 Cavity formation with finger dissection.

Fig. 5 Pouch formation to line the vagina cavity.

Fig. 6 Immediately after the operation.

Fig. 7 One year after the operation.

Case 2, 19- old woman with an adrenogenital syndrome. This patient had previously undergone a vaginoplasty, and a cavity had been made without lining its raw surface, which was connected with the cecal congenital vagina. This primary operation resulted in an annular stricture of the constructed vagina. We therefore planned to enlarge the stricture site and transfer the flaps to the defect. The surgical technique was modified via the perineal approach since this patient had normal anorectal anatomy.

The bilateral pudendal-thigh flaps were designed (Fig. 8) and the stricture site was incised (Fig. 9). The flaps were then elevated above the medial thigh fascia and the original urinary meatus completely exposed (Fig. 10). The pudendal-thigh flaps were transferred into the defect of the posterior vaginal wall (Fig. 11). The ventral wall of the mobilized urogenital sinus was opened and used to create a mucous lined vestibule through the perineal approach, following which the labial flaps were pulled down and were fixed at the bases of the pudendal-thigh flaps (Fig. 12). The inserted flaps provided sufficient width of the vaginal introitus and canal (Fig. 13). The postoperative course was uneventful and vaginal dilation with a dilator was started within 3 months of the operation. There was no recurrence of vaginal stricture one year after the operation (Fig. 14).

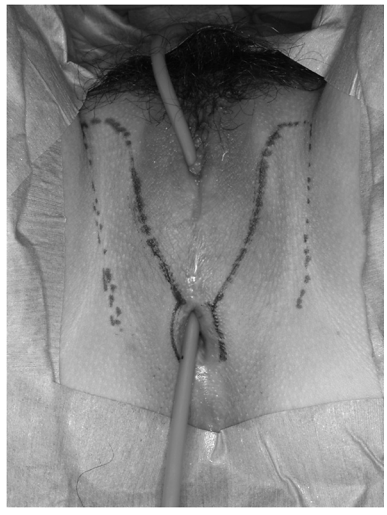

Fig. 8 Design of the pudendal-thigh flap, A catheter tube is inserted into the urogenital sinus.

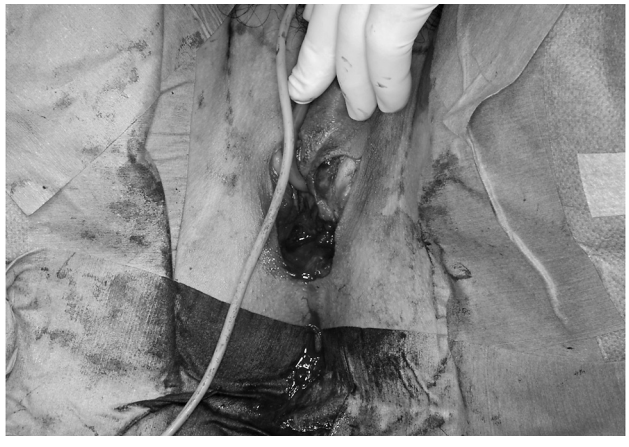

Fig. 9 Incision of the vagina introitus and the stricture site.

Fig. 10 Elevation of the pudendal-thigh flap, Another catheter tube is inserted into the original urethral meatus.

Fig. 12 Immediately after the operation.

Discussion

Testicular feminization is a syndrome caused by androgen insensitivity which occurs in a complete and an incomplete form. Inguinal hernia is a common clinical presentation for a young child with this disease. Most patients usually undergo excision of their hypertrophic clitoris when young and almost all of them have been brought up as a female. They present at hospitals for amenorrhea and often desire a vaginoplasty.

The adrenogenital syndrome is a disorder of adrenal steroid synthesis and can occur in both males and

Fig. 11 Flap transfer into the defect of the posterior vaginal wall.

Fig. 13 Easy insertion of the SS-sized Cusco's speculum.

Fig. 14 One year after the operation.

females. In female cases with this syndrome, a urogenital sinus exists and there is usually no introitus of the vagina, so they present at a hospital for hematuria and amenorrhea.

Vaginal enlargement plasty with a skin graft in these cases is always problematic, since shrinking, particularly of the vaginal introitus, occurs. However, a sufficiently large flap such as the pudendal-thigh flap inserted into the "defect" of the posterior vaginal wall provides sufficient width to the vaginal introitus and canal. The ventral wall of the mobilized urogenital sinus is further opened and used to create a mucous lined vestibule through the perineal approach.

The pudendal thigh flap for the vaginoplasty was first reported by V. T. Joseph from Singapore, so it is sometimes called the "Singapore flap". It is usually used for reconstruction of the vagina, scrotum and urethra. This flap is well-recognized as containing the posterior pudendal vessels and can be elevated safely [5–9]. It also contains the posterior pudendal nerves and can be used it as a sensory flap; furthermore, it can be made hairless using several laser depilation treatments before the operation. Ideally, a reconstructed vagina should be fully lined with a hairless flap without a skin graft.

The most difficult challenge of vaginoplasty in testicular feminization syndrome case is how to reconstruct the labia major to achieve a good shape. In vaginoplasties in male-to-female transsexual cases, abundant skin and soft tissue from the scrotal area can be obtained and used to reconstruct the labia major. If the penis is also present, so we can use it to resurface the vestibule with the penile flap. In the case of testicular feminization syndrome, however, there is usually no scrotum and no penis, so it is hard to get a good volume of tissue for the labial reconstruction and vestibular resurfacing. If the patient wants to get a better contoured labia major, we have to add optional procedures such as a skin graft to the vestibule, a dermal-fat graft or an adiposal flap transfer to the labia major. Neither of our current cases requested an additional procedure.

In the case of female adrenogenital syndrome, a cecal vagina and an urogenital sinus already exist, so the full depth of the vagina does not have to be created. For these cases we make only the introitus and short canal of the vagina. In a lower urogenital sinus type like this case, we can use the urogenital sinus to create a mucous lined vestibule. In addition the labial flaps can be used only to reconstruct the labia major, so a good contour of the labia major can be achieved.

Conclusion. We reconstructed the vagina with a pudendal-thigh flap for 2 different types of intersexual patients. There was no complication such as flap necrosis, the donor scar was not remarkable and the patients were satisfied with the results. We believe that the pudendal-thigh flap is the one of the best sources for vaginoplasty in intersexual patients.

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