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Aesthetic and functional reduction of the labia minora using the Maas and Hage technique☆

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Summary *Introduction:* Enlarged labia minora can cause functional, aesthetic and psychosocial problems. There are many reported techniques for their surgical correction in both the gynaecological and surgical literature suggesting that no one method is superior to the others. The problem is compounded because an individual surgeon's experience is likely to be small given the infrequent request for surgery. For these reasons it is important that existing techniques are validated by independent surgeons rather than describing yet another variation.
Methods: Patients who underwent surgical reduction of their labia minora from 2001–2008 were retrospectively reviewed. All cases were performed by the same surgeon using the Maas and Hage technique of a running interdigitating W-shaped excision.
Results: 12 patients aged from 15 to 52 years underwent reduction labioplasty for idiopathic hypertrophy. Postoperatively there were no wound dehiscences or infections. One patient developed a painful haematoma 2 h after surgery necessitating surgical evacuation while another went into postoperative urinary retention relieved by overnight catheterisation. Both made uneventful recoveries. All patients were satisfied with their 'natural looking' cosmetic results and have returned to their normal activities without recurrence of their presenting symptoms. The mean follow up was 14 weeks but none have subsequently required or requested revisional surgery.
Conclusions: The running W-shaped resection was found to be an easy and effective method of reducing the labia minora by a single operator in a small series of cases. This independent review demonstrates the reproducibility of this technique and the favourable aesthetic and functional outcomes for the patient.

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Table 1 Characteristics of patients undergoing Maas and Hage reduction labioplasty.

Patient	Age	Parity	Sexually active	Enlargement	Patients main complaint	Size of resection	Complications
1	36	0	Yes	Symmetrical	Unhappy with appearance	L: 37 × 15 × 4 mm R: 35 × 15 × 4 mm	None
2	16	0	No	Symmetrical	Very self conscious	L: 30 × 20 × 5 mm R: 35 × 17 × 6 mm	None
3	15	0	No	Asymmetrical	Personal hygiene problems	R: 32 × 19 × 7 mm	None
4	41	2	Yes	Asymmetrical	Uncomfortable when sitting	L: 35 × 12 × 4 mm R: 43 × 15 × 4 mm	Minor ooze for 48 hours
5	24	1	Yes	Asymmetrical	Unhappy with appearance	L: 30 × 10 × 3 mm R: 40 × 12 × 4 mm	Mild discomfort
6	43	0	Yes	Asymmetrical	Horse riding & cycling problems	L: 62 × 20 × 6 mm R: 60 × 20 × 6 mm	None
7	22	0	No	Asymmetrical	Very self conscious	L: 70 × 30 × 10 mm R: 65 × 35 × 15 mm	Urinary retention
8	41	1	Yes	Symmetrical	Shows through clothing	L: 35 × 25 × 5 mm R: 40 × 25 × 5 mm	Bilateral haematomas
9	35	2	Yes	Asymmetrical	Very self conscious	L: 80 × 15 × 3 mm R: 60 × 15 × 3 mm	None
10	52	3	Yes	Symmetrical	Very self conscious	L: 55 × 18 × 6 mm R: 45 × 25 × 5 mm	None
11	31	3	Yes	Asymmetrical	Unhappy with appearance	L: 35 × 14 × 5 mm R: 25 × 12 × 3 mm	None
12	23	0	Yes	Asymmetrical	Interferes with horse riding	L: 40 × 16 × 6 mm R: 30 × 20 × 4 mm	None

L = Left, R = Right.

Enlargement of the labia minora can be congenital or acquired through chronic irritation, androgen administration or intentional labial expansion from manual stretching and weights as practised by the Hotentot tribe.[1] Other reported causes include excessive masturbation, early onset of intercourse and multiple pregnancies.[2] There is little consensus on the definition of labia minora hypertrophy, with a wide variation on what is considered normal. A distance of more than 4—5 cm from the base to the edge of the labium when under mild lateral traction has been suggested in an attempt to provide an objective definition.[3,4] When deciding on the need for surgical intervention the symptoms described by the patient are more important than measurements alone. These issues can be functional, aesthetic and psychological.

Common functional complaints include chronic irritation, problems with personal hygiene, difficulty performing intermittent self-catheterisation and interference with sexual intercourse and other activities such as cycling and horse riding.[2—4] The aesthetic and psychological indications for surgery are becoming increasingly common because of the easy access to graphic examples of female genitalia through modern media. This enables patients to compare their own genitalia with these idealised versions. Consequently they often consider their enlarged labia as ugly and embarrassing in comparison, with significant adverse effects on their self-esteem and ability to relate to partners. Other common aesthetic complaints are the hypertrophied labia minora being noticeable through tight trousers and swim suits which can restrict the patient's social activities. Moreover, in some societies, this condition carries a significant stigma as it is considered to be a sign of promiscuity and frequent masturbation.[5]

At present most surgeons' experience with labia minora reduction is limited because it is an infrequently requested operation. In contrast there are many articles in both the gynaecological and plastic surgical journals describing various techniques for this surgery. These include simple excision of the protuberant labial tissue with oversewing of the labial edge,[6] excision of labial tissue using interdigitating W-shaped plasties,[7] the de-epithelialized reduction labioplasty[5] and central or posterior wedge excision of the labial tissue with and without the use of flaps and Z-plasties.[3,4,8—10] No one technique has been shown to be superior to the others. For these reasons it is important that existing techniques are validated by independent surgeons rather than describing yet another variation. We therefore decided to analyse our results of labia minora reduction using the running W-shaped resection first described by Maas and Hage[7] in 2000.

Patients and methods

A retrospective review of all 12 patients who underwent labia minora reduction by the senior author (CMM) using the Maas and Hage technique of a running W-shaped resection with interdigitating suturing from 2001 to 2008 was conducted. Their mean age was 32 years (range 15—52) and none had an identifiable cause for the labia minora enlargement, which was bilateral in 11 of them (Table 1).

All operations were performed under general anaesthesia with patients in the lithotomy position. Opposing W-shaped markings were made on the internal and external surfaces of the labia minora, without encroaching on the

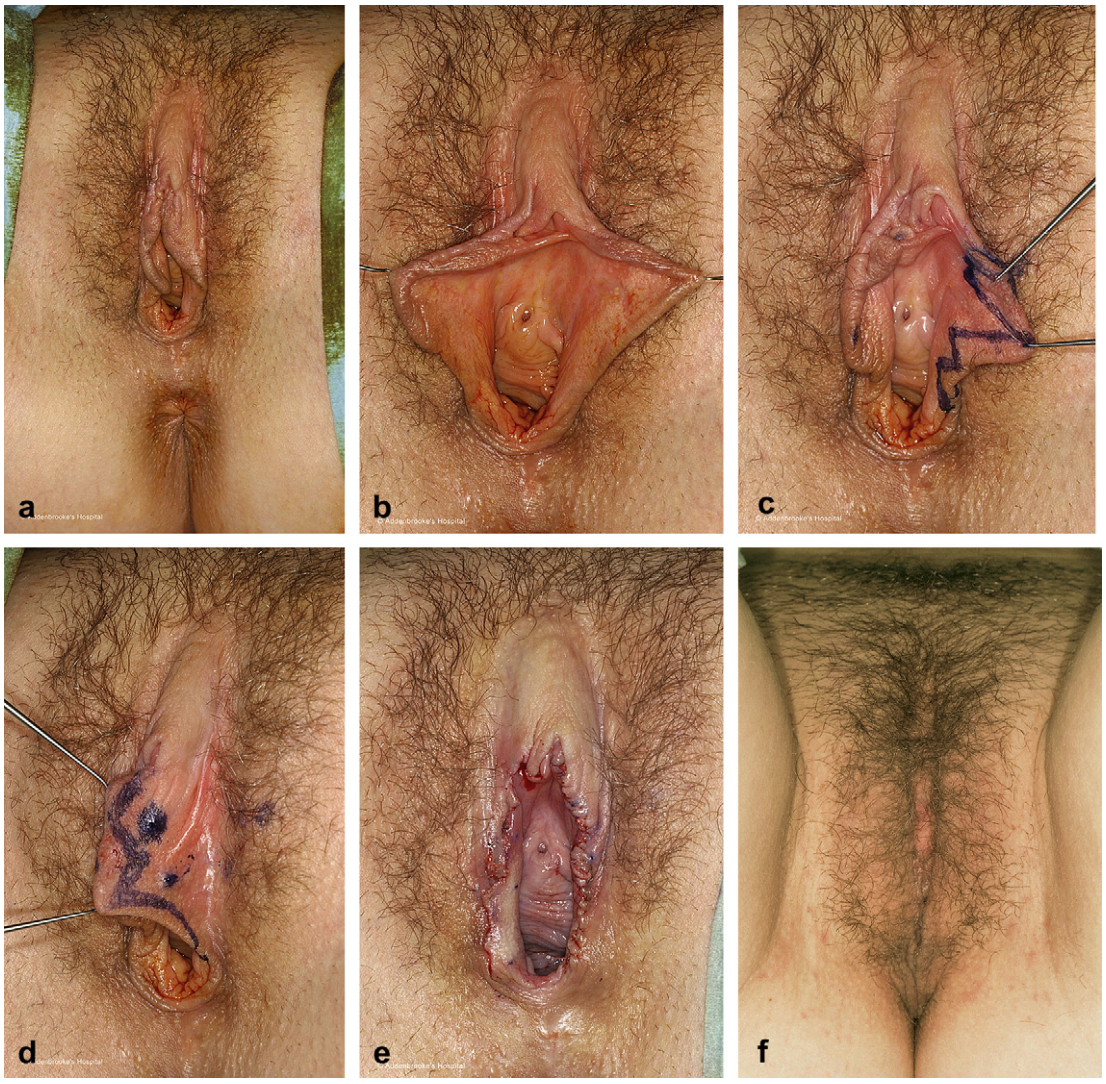

Figure 1 (a, b) Bilateral asymmetrical hypertrophy of the labia minora in a 24-year-old patient. (c, d) Intraoperative planning of the W-shaped resection with tattoo points used to ensure that the lateral and medial markings are complementary. (e) Immediate postoperative view after excision of the protuberant tissue and closure in 2 layers using interdigitating W-plasties. Please note the preservation of the posterior fourchette. (f) Three months postoperative appearance. The labia minora are now flush with the labia majora as per the patient's preoperative request.

clitoral hood and stopping at least 1 cm from the posterior fourchette. The residual labia minora were planned to be at least 1 cm from base to edge to allow for a natural slight protrusion over the labia majora. However, the amount of labial protrusion was adjusted according to the patient's desired appearance as discussed preoperatively. In order to ensure that the markings were complementary, a hypodermic needle and Bonney's blue were used to tattoo the valleys of the W onto both surfaces of the labia to delineate the tissue to be removed (Figure 1c and d). Local anaesthetic consisting of 0.25% bupivacaine with 1: 200,000 adrenaline was infiltrated. The labia were then excised in turn and haemostasis achieved. The W-shaped wound edges were closed in two layers with interrupted deep dermal sutures (5-0 monocryl©) followed by continuous absorbable sutures (5-0 vicryl rapide©) for the skin (Figure 1e). Polymyxin B—bacitracin ointment (Polyfax©) was applied to the suture lines and the area dressed with jelonet and a sterile sanitary pad. Postoperative treatment consisted of simple analgesia, an oral antibiotic for five days and regular application of Polyfax© ointment to the suture lines for one week. Patients were discharged home either on the same day or the day following surgery. They were reviewed at one week, two weeks and 3 months.

Results

Over the six-year period 12 patients underwent bilateral (11) or unilateral (1) labia minora reduction (Table 1, Figures 1—3). The mean size of the excised labial tissue was $44 \times 19 \times 5$ mm. The recovery period was unremarkable for most patients, with no major adverse events occurring. One patient developed bilateral tense haematomas 2 h post-surgery requiring evacuation in theatre, while another went into postoperative urinary retention relieved by overnight

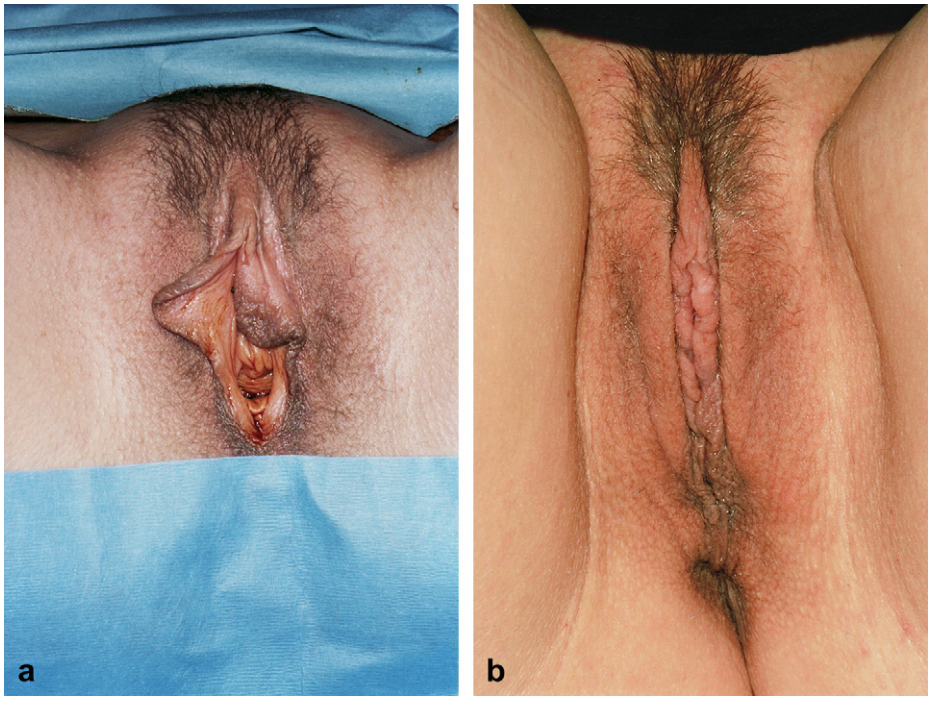

Figure 2 (a) Bilateral symmetrical hypertrophy of the labia minora in a 36-year-old patient. (b) Five months postoperative appearance with which the patient was very pleased.

catheterisation. A third patient had some minor oozing that resolved spontaneously within 48 h. These three patients all made uneventful recoveries. There were no wound complications such as infection or dehiscence. The mean length of follow up was 14 weeks (range 2—49). At the time of final follow up, all patients were very satisfied with the appearance of their external genitalia and reported no recurrence of their previous symptoms. They also reported no interference with any of their usual daily activities or with intercourse. In the intervening period none of the patients have requested or required any revisional surgery. Four patients failed to attend the 3-month follow up and were not seen elsewhere, which was thought to be due to patient satisfaction with the procedure and an uncomplicated recovery period.

Discussion

The running W-shaped labia minora resection technique was chosen because it is based on sound plastic surgery principles. The closure of the opposing W-shaped incisions

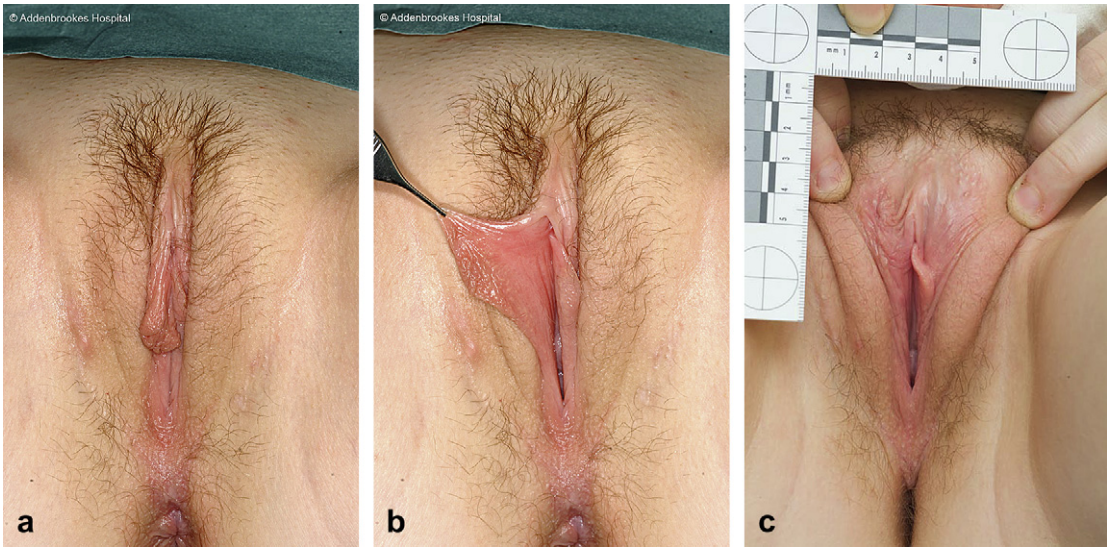

Figure 3 (a,b) Unilateral hypertrophy of the right labium minus in a 15-year-old patient. (c) Four months postoperative appearance showing a satisfactory degree of labia minora symmetry.

results in a tensionless zigzag suture line running obliquely across the edge of the labium. This breaks up the scar thus preventing wound contraction in both the longitudinal and transverse directions. It also acts to reduce the risk of wound dehiscence and advancement of the posterior fourchette which can lead to tightening of the introitus.[7] Sexual function and sensation are preserved as the anterior and posterior commissures are left intact and the tissue around the base of the labia minora where the branches of the superficial perineal nerve enter is undisturbed.

As a result of utilising these principles, the running W-shaped resection technique avoids many potential problems that can occur with other techniques. Simple excision of the protuberant labium produces a scar running along the new edge of the labia, which can be fragile and stiff, producing local irritation and discomfort during activities such as walking.[3] The wedge excision methods can suffer from wound dehiscence, narrowing of the introitus and creation of a sharp colour change[8] at the suture line between the anterior and posterior labia minora. One series of 163 patients undergoing posterior wedge excision of the labia minora showed a 7% wound dehiscence rate resulting in a poor aesthetic appearance that required a second operation.[4] The de-epithelialised labioplasty technique manages to avoid these previously mentioned problems, but has its own drawbacks. These include the possibility of redundant labial width and increased thickness of the labia minora as the central parenchyma is retained.[8] This method is also technically difficult due to the need to perform accurate de-epithelialisation of the very thin labial skin.

Similar to other series,[3,9] all our patients had idiopathic hypertrophy which was mostly bilateral and asymmetrical (Table 1). Our series, however, highlighted that it is principally the younger woman who seeks labial reduction for mainly aesthetic reasons in contrast to other authors[5,7] who have reported functional complaints as the major problem. It was also interesting that the mean maximum dimension of the resected tissue was 44 mm which is less than the arbitrary objective definition of labia minora hypertrophy previously suggested.[3,4] This indicates that not all patients requesting this surgery may satisfy the arbitrary definition of labia minora hypertrophy and further emphasises that it is not the precise labial dimensions, but rather the patient's perceptions and symptoms which are important in determining the need for surgery. The presumed drawbacks of this technique, such as blunting of the labia, loss of the darker pigmented labial edge[7] and the chessboard appearance created when oversewing the light mucosa and dark cutaneous borders of the labia[8] were never a concern of any of our patients. The rounded soft labial edge was found to be appealing and satisfied the preoperative request for the labia minora to sit at least flush with, or below the level of the labia majora. Additionally, the gradual colour change from the lighter anterior portion to the darker posterior portion of the labia minora was preserved, which probably contributed to greater patient acceptability.

This small independent case series showed that the running W-shaped resection with the interdigitating W-plasty closure produces good postoperative results both aesthetically and functionally. All patients were very satisfied with the functional and aesthetic outcome of the surgery, reporting resolution of their functional problems and improved self-esteem. There was a low incidence of major complications (one haematoma) and no wound infections or dehiscences, indicating the relative safety and effectiveness of this operation even in the hands of a low volume operator.

The Maas and Hage running W-shaped resection technique provided a simple, safe and effective method of reducing enlarged labia minora, while avoiding the drawbacks associated with the other techniques. It resulted in a 'natural looking' appearance of the labia with excellent functional results and high patient satisfaction. For these reasons, we recommend this technique as a reliable and reproducible approach for performing aesthetic and functional reduction of the labia minora.

Conflict of interest

None.

Funding

None.

Ethical approval

This study was a retrospective review of patients operated on by the senior author, Mr. CM Malata. Data were obtained from the patient case notes and stored in a spreadsheet on the hospital computer network accessible only by the authors. All data collected was de-identified preserving patient confidentiality. The results of this study did not impact upon any aspect of patient management. Patient consent was obtained for the publishing of their medical photographs.

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