

In the surgical treatment of uncomplicated vesicovaginal fistula, the vaginal approach is employed in the vast majority of patients. This is the correct attitude for 3 reasons: firstly, because by this approach the majority of fistulae can be cured; secondly, because it is a lesser surgical procedure with fewer complications than an abdominal operation, and thirdly, because vaginal operation involves a territory with which the gynaecologist, in whose department these cases are generally treated, is thoroughly acquainted.

The above is especially true for those fistulae resulting from prolonged labour. Most of these fistulae are situated low on the trigone, at the bladder neck or in the urethra. Abdominal operation has no place in the initial management of these cases. However, after repeated attempts at closure *per vaginam*, the fistulous opening may gradually work upwards away from the bladder floor¹ and may then be accessible to suprapubic repair. Where a vaginal operative procedure is indicated in the management of obstructed labour, e.g. in the application of forceps or craniotomy, the vesicovaginal fistula that may result is frequently in the region of the interureteric ridge or even higher. More recently, with extensive surgical procedures in the pelvis being done more frequently, with the use of irradiation for pelvic cancer and with proper obstetrical care available for most population groups, a much larger proportion of vesicovaginal fistulae are located above the trigone of the bladder.

It is the opinion of most gynaecological surgeons that the vaginal route is quite adequate for the repair of all vesicovaginal fistulae. Te Linde² has never encountered a fistula in which he felt that a suprapubic approach could have had any advantage. Moir³⁻⁵ feels that the abdominal approach should be reserved for very exceptional cases, less than 3-4% of the total. The vaginal route is considered safer and surer than the transvesical or transperitoneal.⁶ Carter *et al.*⁷ report using the abdominal approach in 2 of 73 cases, Counsellor and Haigler⁸ in 5 of 253, Foda⁹ in 4 of 220, O'Connor and Sokol¹ in 11 of 54 cases, while Naidu¹⁰ used it in only 1 of 208 patients.

Some gynaecological surgeons and most urologists feel that there is a certain proportion of fistulae, varying in number according to the cause of the injury, where the ideal method of treatment can best be decided on after full uro-gynaecological study, including the status of the upper urinary tract, the relation of the

fistula to the ureteric orifices, the presence of epithelialization of the fistulous tract, the pliability of the tissues surrounding the fistula and the outcome of previous operative procedures. Schneiderman and Streen¹¹ base their approach for repair of the fistula on its location in relation to the trigone. They favour the suprapubic route if the fistulous tract leads from the upper vagina to the retrotrigonal area. This view is also held by Immergut and Cottler¹² and Taylor,¹³ while Miller¹⁴ uses the abdominal approach for fistulae just inside the trigone, in the midline, in or near the ureteric orifice or above the trigone. Counsellor and Haigler⁵ use the abdominal approach if the fistula is high and cannot be exposed or if it is complicated by a rectovaginal fistula. Several authors^{12,13} stress the advisability of abdominal approach when the fistula is situated above the trigone and opens through a scarred, fixed vaginal vault, usually following total hysterectomy, when there is no cervix to use as a tractor.¹⁵ Moir^{3,4} however, points out that most traumatic fistulae show no loss of tissue and that the surrounding tissues are usually soft and vascular, allowing the damaged parts to be drawn down to within easy reach of repair by the vaginal route. Other indications for abdominal approach are inadequate vaginal exposure or repeated failure of vaginal repair.¹³

Advantages of Abdominal Approach

Several important advantages are claimed for the abdominal approach. Adequate exposure of the fistula under direct vision is possible. This permits adequate mobilization of the tissues at the margin of the fistula into separate layers, complete clearance of scar tissue and meticulous closure with inversion of the mucosal edge into the bladder. Because the ureteric orifices can be seen—and the ureters intubated if necessary—dissection and closure can proceed with greater freedom and confidence. In this way closure of the bladder without tension is easier to achieve. It is possible to close the defect in the vesicovaginal septum¹² and in this way provide adequate support for the mucosal suture layer. By the abdominal approach repair or reimplantation of the ureter is possible if this is necessary because of injury to the ureter or involvement in the fistula. If suprapubic drainage is required postoperatively, it requires no additional surgical procedure when using the abdominal approach.

Of the suprapubic techniques the transperitoneal transvesical approach is that most favoured. The extraperi-

toneal technique is not recommended.⁴ A few authors^{16,17} use a combined vaginal and transvesical technique with success.

Over a period of 9½ years from 1954 to 1963, 246 patients suffering from vesicovaginal fistula were seen at Edendale Hospital, Pietermaritzburg. Of this total, 240 fistulae were associated with childbirth and its complications. Prolonged labour alone caused 133 cases, and it followed vaginal operative procedures (forceps delivery, craniotomy, etc.) in 69 patients, while caesarean section, repair of a ruptured uterus or hysterectomy preceded fistula formation in 38 cases. However, since these procedures were performed almost always after prolonged labour, their precise role in the causation of the fistula was difficult to assess.

A programme of treatment was determined for each patient after gynaecological and urological study and consultation, and modified during the course of treatment when necessary. Vaginal operative procedures were used in 204 patients; in 24 patients special techniques were necessary while a suprapubic operation was performed in 18 patients. In these 18 patients the fistula followed an abdominal operative procedure during childbirth in 13 cases. It is clear, on comparing this figure with that for the whole group, that the high fistula (for which a suprapubic approach may be used) much more frequently follows operative trauma, while the low vesicovaginal and urethrovaginal fistula is almost always the outcome of a prolonged labour with a low-lying foetal head.

Deciding Factors

In deciding to approach the fistula from above, two considerations were considered especially important. Firstly, the anatomical localization of the fistula in the bladder—if the bladder opening of the fistula was located partly or wholly above the interureteric ridge, suprapubic operation was strongly considered. If the vaginal opening was located high up in a scarred and fixed vaginal vault, abdominal approach was further favoured. Secondly, the relation of the lower ureter to the fistula—if the ureteric opening was dangerously close to the margin of the fistula, or if the intramural ureter was involved in the fistula and the possibility of reimplantation was considered, a suprapubic approach was considered necessary.

The operative technique was identical in all cases and the patients were all cured after a single operation.

Technique

With the patient in a moderate Trendelenburg position, the peritoneal cavity is opened through a left paramedian incision from the pubis to just above the umbilicus. The surgeon, if right-handed, works from the left side of the patient. After a self-retaining abdominal retractor has been placed and the bowel packed out of the way the bladder is opened in the midsagittal plane from its dome downwards into the fistula. The ureteric orifices are located, 6F ureteric catheters passed up the ureters and left in position during the operation. The whole thickness of the bladder wall is dissected from the cervix and the vaginal vault, beginning at the peritoneal reflexion and working down to and around the fistula, excising the epithelialized fistulous tract if this is present. The dissection must proceed until pliable bladder wall and vagina is reached and the bladder edges can be approxi-

mated with no suggestion of tension. A certain amount of venous ooze is always present during this stage.

The first layer of bladder sutures is now inserted. This consists of closely-spaced interrupted sutures of 3-0 atraumatic chromic catgut placed in the inner layer of bladder muscle emerging immediately deep to the mucosal edge. If correctly done the line of mucosal apposition is virtually invisible and no suture is exposed on the mucosal aspect. The ureteric catheters are withdrawn and any blood removed from the bladder by suction just before completing this layer. The second layer consists of interrupted sutures of the same material to close the outer layer of bladder muscle in the extraperitoneal part and a continuous seromuscular suture for the remainder of the bladder closure. Just before starting the seromuscular suture, a corrugated rubber drain is passed down into the vagina with its upper end lying in the vesicovaginal space extraperitoneally. The vaginal fistulous opening is loosely closed around the drain.

The abdomen is closed in the usual way. The perineum is exposed. The lower end of the rubber drain is delivered and anchored with a stitch. An 18F Foley catheter is placed in the bladder, gently irrigated to confirm the absence of bloodclot and anchored to the vulva with a cross-stitch. The bulb of the catheter is not inflated.

Postoperatively the patient is nursed in the dorsal position with 3 pillows, with continuous dependent drainage of the urethral catheter. 0.5 G of sulfadimidine is given 3 times a day and an adequate fluid intake maintained. The drain is removed after 3 days and the urethral catheter 12 days after operation.

ILLUSTRATIVE CASE REPORTS

Case 1

An African female, aged 30 years, had a ruptured uterus due to obstructed labour. At laparotomy a low anterolateral tear was found and sutured. On the 2nd postoperative day urine started to leak from the vagina and on the 8th day a urinary leak from the abdominal wound was noticed. Wound dehiscence occurred on the 12th day and this was resutured. On admission she was found to have a large vesicovaginal fistula through which a sound could be passed to the abdominal wall. The intravenous pyelogram showed some stasis on the right side (Fig. 1). Cystoscopy showed a large fistula situated just medial to the right ureteric orifice. A ureteric catheter passed into the fistula emerged from the abdominal wall. A catheter passed up the right ureter without obstruction and the retrograde pyelogram confirmed slight dilatation of the ureter and pelvis (Fig. 2). Laparotomy was performed 2 months after confinement. The fistulous tract was traced from the abdominal wall through the lower part of the uterus and bladder into the vagina. The lower end of the right ureter was identified and mobilized. The remnant of the uterus was removed. The bladder was opened, dissected from the vagina and the fistula closed.

Primary healing of abdominal wound and fistula followed.

Case 2

An African female, aged 30 years, aborted at 5 months. While performing removal of the retained placenta, rupture of the uterus occurred. At operation the tear was found to extend into the bladder on the left side. Both organs were repaired. A urinary leak from the vagina started on the 8th postoperative day. On admission she was found to have a vesicovaginal fistula with its vaginal opening in the torn cervix. Intravenous pyelography demonstrated definite dilatation of the left pelvis and ureter (Fig. 3). Cystoscopy showed an irregular fistulous opening in the position of the left ureteric orifice—the orifice itself could not be definitely identified. At operation the bladder was opened and the left ureter found to open into the fistulous tract. The ureter

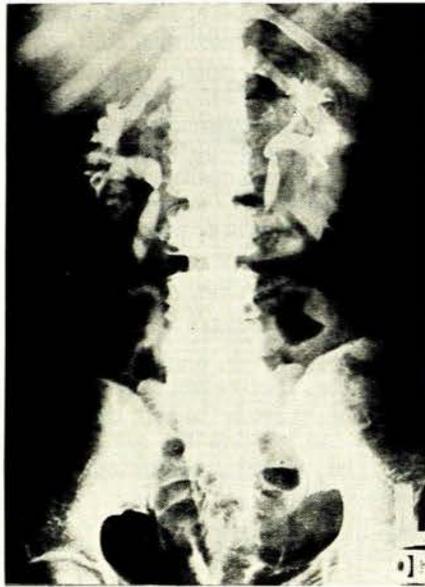


Fig. 1

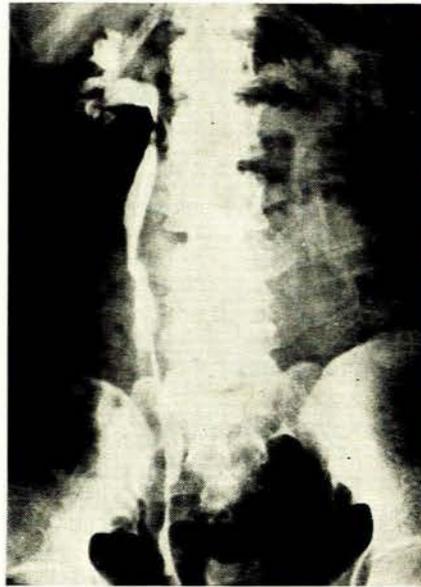


Fig. 2



Fig. 3

Fig. 1. Intravenous pyelogram showing mild obstructive changes right side (case 1). Fig. 2. Retrograde pyelogram confirming mild hydronephrosis right side (case 1). Fig. 3. Intravenous pyelogram. Hydronephrosis and hydroureter left side (case 2).

was divided close to the bladder and retransplanted higher up. The bladder was dissected free and the fistula closed. Primary healing occurred. A postoperative pyelogram showed considerable improvement in the dilatation of the left upper urinary tract.

DISCUSSION

Certain points in surgical technique are considered especially important to secure a successful operative result. The bladder is opened sufficiently widely to allow adequate visualization of the whole operation area. Mobilization of full-thickness bladder wall to secure apposition without tension is most important. There is no need to split the bladder into mucosal and muscular layers. Meticulous submucosal sutures as a first-layer closure of the bladder is second in importance only to adequate mobilization. Closure of the vaginal wall is not considered an important technical point. Extraperitoneal drainage prevents a haematoma in the vesicovaginal septum.

Postoperative drainage of the bladder is a much debated aspect of technique. Cystotomy and temporary diversion of the urine by indwelling ureteric catheters for 8 days is advised by Immergut and Cottler¹² and Moir.³ Suprapubic and urethral catheter drainage is used by O'Connor and Sokol¹ and Morgan¹⁵ while suprapubic drainage followed by urethral catheter drainage is advised by Streat¹⁷ and Roen.¹⁶ Suprapubic drainage only is used by Taylor¹³ and Miller.¹⁴ The period of drainage varies from 8 to 21 days. Nursing in the prone position to assist drainage is used by Taylor¹³ and Roen.¹⁶ Low-suction suprapubic drainage is considered ideal by Marshall and Twombly.¹⁷ Simple dependent urethral catheter drainage is considered completely satisfactory.

In properly selected cases the results of suprapubic closure of a vesicovaginal fistula are very good. In the recorded series the success rates vary from total in several

reports,^{3,7,8,10,13,15} to 13 out of 15,¹² 10 out of 12,¹⁹ 15 out of 16¹⁵ and 9 out of 11.¹

The surgeon who undertakes the closure of a vesicovaginal fistula by the abdominal route must be virtually certain of achieving a successful closure in one operation. This can be achieved only by combining careful selection of cases with a meticulous operative technique.

SUMMARY

The surgical repair of vesicovaginal fistula is discussed.

A positive approach, in which the gynaecologist and urologist cooperate, is advised to decide on the most suitable management of the individual case.

Intraperitoneal transvesical approach is recommended for a selected group of cases and a surgical technique, used successfully in 18 patients, is described.

All these patients were referred by Mr. D. Lithgow, Senior Obstetrician and Gynaecologist, Edendale Hospital, Pietermaritzburg.

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