

VESICOVAGINAL FISTULA—A STUDY OF 269 CASES

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Urinary fistulae have been known for the past 4500 years. Several excellent surveys on this subject have been published so far. Of these the monograph by Sims and the papers by Mahfouz are particularly useful.

It seems to be fairly common in developing countries (Foda 1959; Boldt 1959; Thomas 1945; Lawson 1967; Serafino 1958), including India (Hayes 1945; Yennen *et al* 1965; Krishnan 1949; Lazarus 1959; Naidu 1962). During the past 10 years (1961 to 1970) in the Erskine Hospital, Madurai, the incidence of urinary fistulae was 1 in 446 gynaecological admissions. In a personal series of 274 urinary fistulae treated in our unit, 269 were vesicovaginal and the remaining five ureterovaginal. Of the bladder fistulae, 262 (97.3%) were of obstetric origin, 6 due to surgical trauma during gynaecological operations and one followed bullgore injury.

As the commonest cause of fistulae in our series was indirect obstetric trauma mainly due to prolonged and obstructed labour over 80% were in the age group of 15 to 30 years. Nearly 60% of them were primiparae and 40% multiparae, including 16% who were grandmultiparas. The delivery preceding the fistulae was mainly by forceps or craniotomy, but 11% had abdominal delivery following late labour. (Table 1). No fistula in

TABLE I
*Nature of Delivery Preceding Obstetric
Fistulae*

	No.	Per cent
1. Forceps with or without craniotomy	190	72.5
2. Prolonged labour, vaginal delivery ..	40	15.3
3. Caesarean, 10: Rupture uterus: 19 ..	29	11.0
4. Extended breech, 1; Decapitation (2) ..	3	1.2
	262	100.0

this group was due to operative trauma in labour. The perinatal mortality was 95.8% of this series.

The dribbling was noticed in 84% during the first week and in 13.3% during the second week and in the remaining during the third week of delivery. One patient had menouria. The duration of the fistula varied from few weeks to 22 years. Eighty per cent reported within a year, though 9% sought admissions over 5 years after the complaint started. The size and type of the fistulae depended on the parity, level of obstruction in the pelvis and duration of labour. The size varied from a pin point to almost the entire anterior vaginal wall. In 60% it was 2 cm. or less in diameter, but in 12% it was over 5 cm. (Table II). In most primigravidae it was midvaginal or at the bladder neck; but over 85% of the juxtacervical and all vesicocervical fistulae were in multiparous women. In a few it was seen in the fornices or at the

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TABLE II
Bladder Fistulae, Distribution According to Size

	No.	Per cent
Admitted a probe ..	16	5.9
Upto 2 cms. ..	150	53.7
2 to 5 cms. ..	66	23.7
Over 5 cms. ..	33	11.8
Through external os	14	4.9
	279*	100.0

* Include 9 cases of multiple fistulae.

vaginal vault (in those who had hysterectomy for colporrhexis) (Table III).

TABLE III
Distribution of Bladder Fistulae According to Their Location

	Percent
Midvaginal	46.0
Juxtacervical	20.4
Bladder neck & juxtaurethral ..	13.0
Anterior vaginal wall	10.4
Vesico-cervical	5.2
Vault	2.6
Fornices	2.5
	100.00

Dense scarring was present in 25 with cicatricial rings in 7 and in one there was vaginal pouching to produce a calculus. In 39, bone was found at the margin of the fistulae.

Bladder fistulae were associated with faecal incontinence in 10.4% of cases (Table IV). In 11.5% of our material the cervix was torn and in 10 it was caught in scar tissue. The urethra was blocked in 15 and was partially or completely destroyed in 5 per cent. In an equal number of cases, peroneal palsy was present. Vesical calculus was noticed in 8.

TABLE IV
Associated Lesions in Urinary Fistulae

	No.	Percent
Complete perineal tear	21	10.4
Rectovaginal fistulae	7	
Torn cervix	30	11.5
No cervix	1	
Short urethra	9	5.0
No urethra	13	
Avulsion of urethra	14	11.0
Blocked urethra	15	
Bladder calculus	8	—
Peroneal palsy	12	4.8
Prolapse uterus	4	—
Others	2	—
Total	136	

Prior to surgery, all cases were carefully examined in the theatre to plan the type of operation needed in each case. Intravenous pyelography was done only in those where the ureteric openings were close to the fistulous margins, in those with bladder calculi and cases requiring diversion of urinary stream. Repair was done 12 weeks or more following the delivery after improving the general and local conditions. Except in 2 cases where the fistulae were located high up in the cervix the repair was done vaginally with the patient in lithotomy position with slight Trendelenberg position. The operation was mainly of the flap splitting type but was modified depending on the location of the fistulae and the amount of scar tissue. The suction was found useful to keep the field dry. After mobilising the vagina well and achieving haemostasis, bladder was closed with interrupted No. 000 chromic catgut sutures in 2 layers before ap-

proximating the vagina. The bladder was drained continuously for 2 weeks postoperatively. In all juxtaurethral fistulae, those with avulsed or blocked urethra and those requiring urethroplasty a preliminary vaginal cystotomy and bladder drainage was established initially. When marked scarring was present deep episiotomy or—Schuchardt's incision was made to make the fistula easily accessible. In 15 cases, where the fistulae were on to a side in the fornix or close to the bone with lot of scar tissue and the vaginal flaps were inadequate, labial grafts were used. All these cases were fortunately successful. In vault fistula a cruciform incision was made and after mobilising the bladder it was closed in layers. Modified Latzko's procedure was adopted only in 2 cases. In all parous women with 2 or more live children, vaginal sterilisation was done first, before repairing the fistulae.

Large Fistulae with Bladder Prolapse: There were 33 such cases and in these repair was not easy due to the extent of destruction. In a third of them, ureters were visible near the margins of the fistulae. At either ends often the pubic arch or dense scar tissue could be felt and if the cervix was fixed the mobilisation posteriorly too became difficult. The situation was worse if the urethra was short or totally destroyed. Very little tissue was available in these fistulae for preliminary vaginal cystotomy and for closure without tension. Ureteric catheters were first passed through the exposed ends of the ureters and brought out through the urethra. First, the upper margins were reflected; next, the lower and finally the lateral margins were mobilised. The sides were first closed and then the rest of it. Suturing vertically is said to reduce chances of stress

incontinence, but this is not always possible. Repair after such large scale destruction is mostly followed by stress incontinence.

In 4 cases where prolapse of the uterus was also present vaginal hysterectomy and repair was done. Generous mobilisation was possible following the hysterectomy.

In combined fistulae, both were repaired at the same sitting, the bladder fistula was first repaired followed by repair of the rectovaginal fistula (or complete perineal tear). If the repair of the vesicovaginal fistula is difficult or repeated attempts at closure fail, the rectovaginal fistula is first closed. If the latter is large or located high up or surrounded by dense scarring a preliminary colostomy is done followed at a late date by repair of both fistulae. If the bladder fistula is found irreparable, ureterosigmoidostomy is done after the rectovaginal fistula has healed. Out of 26 such cases transplantation was done in 2 (one was large bladder fistula where repair was unsuccessful after 4 attempts; another was a large vesicovaginal fistula with destruction of urethra where 3 attempts at repair failed).

In bladder fistula associated with stones, first the calculus is removed by the vaginal route or per abdomen if it is larger. The repair may be carried out after 3 to 4 months after the infection is cleared. If scarring or bladder neck obstruction is present it is dissected out to avoid recurrence of stone and the fistula.

Only 2 cases (both following hysterectomy for rupture of the uterus) in this series had abdominal repair, as the vaginal approach had to be given up

Results

Out of 269 fistulae, 228 (85.4%) were closed at the first attempt. (Table V). Three had transplantation of ureters into

TABLE V
Results of Treatment of Urinary Fistulae

	No. of cases	Successful	Trans-plantation	Failed	Refused Surgery	Total
I attempt	267	228 (85.4%)	..	39	2	269
II attempt	39	20	..	19	..	
III attempt	19	3	..	16	..	
IV attempt	(16)		3	13	..	
Total		251 (93.3%)	3	13	2	

the sigmoid and two others refused surgery. In 13 where the repair failed, 9 could be closed with further attempts and probably 4 more may need diversion of urinary stream.

Stress incontinence following repair was seen in 26 (10%) cases and was mostly relieved by physiotherapy. As it persisted 3 to 4 months later, vaginal repair of Kelly's type was done in 8 of them and in 2 cystopexy was performed in addition. Even cystopexy failed in one of them where there was such gross lack of control requiring transplantation of ureters. She had a successful closure of a large fistula but not functional restoration of the bladder.

There was no death in this series.

Delivery Following Repair of the Bladder Fistulae: Out of 262 obstetric fistulae, 49 multiparous women had vaginal sterilisation during the repair and 21 were already sterilised earlier (with caesarean 2 and for rupture of the uterus 19). Of the 156 patients in reproductive age group, 30 had total of 37 pregnancies—18 caesarean section; 13 successful vaginal deliveries (4 premature), 2 craniotomies for obstructed labour once again and 4 abortions.

Discussion

Obstructed labour seems to be the com-

monest cause of vesicovaginal fistula in India. It may be seen from (Table VI)

TABLE VI
Etiology of Bladder Fistulae

	Total cases	Obstetric trauma (Per cent)	Gynaecological causes (Per cent)
Moir (1965) ..	324	24.4	75.6
Counsellor et al (1956) ..	253	8.0	92.0
Masee et al (1964) ..	262	5.7	94.3
Foda (1959)	220	87.0	13.0
Yennen & Babuna (1965) ..	197	83.8	9.6
Serafino et al (1968) ..	320	83.0	10.0
Naidu & Krishna (1962) ..	208	96.6	3.4
Lazarus (1959) ..	242	95.0	5.0
Devi (1965) ..	500	95.0	5.0
Ours ..	269	97.3	2.7

that 85 to 98% of these fistulae are of obstetric origin in developing countries. Compared to this in developed countries gynaecological surgical trauma accounts for 75 to 95 per cent of bladder fistulae as most obstetric patients are booked

early and the deliveries are mainly institutional. In our hospital the incidence of obstructed labour is 1 in 30 cases; and in a careful study of these cases, we found that 3.2 per cent of them subsequently developed urinary fistulae. Similarly in 464 craniotomies performed from 1960 to 1968 in this institution, mostly for obstructed labour, Jayalakshmi reported urinary vaginal fistula in 5.9% and peroneal palsy in 8.4 per cent. Even after an abdominal delivery these women might develop fistula in the anterior vaginal wall (Rao 1967). Thus, whether the delivery is vaginal or per abdomen, the risk of bladder fistula developing depends on the degree and duration of compression of the bladder before emptying of the uterus. Falk and Tancer (1956) reported vesicovaginal fistulae due to bladder injury during lower segment caesarean section with a vertical incision. However, in none of our cases was the bladder injured during this operation, as the incision in the lower segment was always transverse.

The diagnosis of bladder fistula is easy. A metal catheter passed through the urethra helps in establishing urethral patency (and incidentally rules out the rare possibility of an associated bladder stone) and when its end comes out through the bladder into vagina the diagnosis is obvious. It may be necessary to fill the bladder with methylene blue solution to visualise pin point fistulae. In large fistulae, however, with bladder mucosa protruding out of the ureteric orifices could be easily identified following intravenous indigo-carmin.

The vesical fistulae differ from one another in size, site, density of scar tissue, integrity of urethra, mobility of the cervix, etc. Thus, the type of repair should be planned ahead when the case is ex-

amined earlier. Vaginal repair patiently carried out is mostly successful. In some cases, it may be necessary to reinforce or bridge the defect in the vagina by fibrofatty tissue from labium majus as a pedicle graft or with the gracilis muscle. The abdominal repair should be attempted only when vaginally the lesion is inaccessible as in a high vesico-cervical fistula or during repair when one is not able to reach the posterior margin of the fistula. In his vast experience of 968 urinary fistulae, Mahfouz (1957) found that in a few cases where he failed to repair the fistula from below he failed to close it from above too due to inaccessibility and scarring. Diversion of urinary stream should be attempted only when repeated attempts at repair fail. Personally we do not think any vesico-vaginal fistula should be electively chosen for such a procedure. An apparently incurable fistula may become smaller and may be closed successfully with the second attempt. The incidence of ureterosigmoidostomy in these cases varies from 1.6% (Moir 1965) to 17.7% (Yennen and Babuna 1965). In our own series it was 1.1%. We have no experience with ileal bladder or with colpocleisis.

In all parous women with bladder fistula, vaginal sterilisation concurrently with repair should be seriously considered to avoid a caesarean or the risks of a vaginal delivery later on. The sterilisation can easily be done by opening the pouch of Douglas. Anterior approach interferes with proper bladder repair in some cases. All pregnant women after plastic repair of vagina should be examined during pregnancy to find out the amount of scarring in the vagina or the cervix. In some with cervical tears there is a risk of cervical incompetence resulting in repeated midtrimester abor-

tions or premature deliveries. All successfully repaired cases have to be hospitalised near term for assessment of cephalopelvic disproportion. Caesarean section need not be done as a routine, but is indicated after a successful repair of the fistula when (1) there is evidence of pelvic contraction or previous bad obstetric history (2) closure was achieved with difficulty in a large fistula (3) narrow vagina with lot of scarring (4) successful repair of stress incontinence following closure of a bladder fistula and (5) in cases of cervical dystocia especially following plastic repair in the region of the cervix. Others may be allowed a careful vaginal delivery and caesarean section done when there is lack of progress in labour. Lazarus (1959) reported 29 subsequent deliveries, 21 by caesarean and 6 by the vaginal route. Devi (1965) did caesarean in 52.4% of 67 pregnancies following successful repair of the bladder fistulae compared to 48.6% in our series.

The bladder fistula in developing countries is a social obstetric problem. It is mostly preventible by good antenatal and intrapartum care. Till most of our women accept either early institutional delivery or are provided with supervised skilled intrapartum care at home, we will continue to be faced with varieties of bladder fistulae of obstetric origin in these countries for few more decades.

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