

GENITAL FISTULAE

by

K. BHASKER RAO,* M.D., D.G.O.

Genital fistulae are the most distressing gynaecological conditions. They are more common in developing countries. These fistulae may be urinary, faecal or rarely menstrual. The menstrual fistulae may be uteroparietal or uterovesical.

Urinary fistulae are the commonest of

cases, whether the delivery is spontaneous or operative, vaginal or abdominal, the damage due to ischaemic necrosis may end in the fistula. In contrast, in developed countries surgical trauma is responsible for most of the urinary fistulae (Table I). Rarely direct obstetric

TABLE I
Etiology of Bladder Fistulae

Name of the author with year	Total cases	Obstetric trauma (per cent)	Gynaec. causes (per cent)
Moir (1973)	431	20	80
Massee et al (1964)	253	8.0	92.0
Foda (1959)	220	87.0	13.0
Serafino et al (1968)	320	83.0	10.0
Devi (1965)	500	95.0	5.0
Ours (1974)	297	97.0	3.0

genital fistulae. Of these, vesicovaginal are more common than those involving the ureter or the urethra. Excellent monographs and papers by Sims (1953), Mahfouz (1957), Foda (1959) and Moir (1967) on this subject present us with the relevant historical data including evolution of its treatment from the pre-historical period to the present century. Though the bladder fistulae may result from congenital, inflammatory (lymphogranuloma or tuberculosis) trauma or advanced pelvic malignancies, the most common cause in the developing countries is indirect obstetric trauma due to prolonged and neglected labour. In such

trauma (during craniotomy or decapitation), bull gore injury or radiation necrosis may cause vesicovaginal fistula.

In our series of 302 urinary fistulae, only 5 were ureterovaginal and the rest were vesicovaginal or urethrovaginal (Table II). The vast majority of them were obstetric fistulae and were seen mostly in young short statured women (height less than 140 cms.) of low socio-economic groups (Mallika, 1974). Over 60% of them were primiparous and one out of 6 were grand multiparae in whom the delay in labour might have been due to the abnormal position of the vertex or a large baby. The perinatal mortality was 95% as most of them were delivered late in labour by forceps or

* Director, Institute of Obstetrics and Gynaecology, Madras-8.

TABLE II
Types of Urinary Fistulae Treated by the Author From 1960-1973

		Per cent
Vesicovaginal	: 297 (98.3%)	
Uretero vaginal	: 5 (1.7%)	
Total	: 302	
		Midvaginal 46.5
		Juxtacervical 23.2
		Bladderneck and Juxtaurethral 12.5
		Anterior vaginal wall 10.0
		Vesicocervical 5.0
		Vault 2.5
		Fornices 0.3
		100.00

craniotomy. In 12.5% the delivery was per abdomen for obstructed labour or ruptured uterus. The duration of the dribbling was from few days to 25 years (Rao, 1971 and 1972).

The site and size of the fistula in these cases naturally depends on the type of the pelvis, the level of the obstruction, its duration, the presentation, parity and the degree of cervical dilatation when the arrest occurs in labour. Mostly the pelvis is of the small gynaecoid type and as the obstruction occurs in high mid-cavity the fistula is midvaginal in location. It may involve the bladderneck and the urethra if the delay occurs lower down. Vertex presentation is the commonest. In parous women there is associated descent of anterior vaginal wall and the oedematous cervix may be compressed, torn or even destroyed. In such cases, the fistulae are juxtacervical or may be vesicocervical in nature. The bladder fistulae may be pinpoint in size or may involve almost the whole anterior vaginal wall with prolapse of the bladder mucosa depending on the duration and extent of the damage. Sometimes there may be multiple fistulae. The urethra may be blocked, avulsed or destroyed. In one third of our cases there was scarring in the vagina and cervix and in about

15% it was fairly dense and was bounded by bone. Rarely, the bladderneck obstruction or vaginal cicatrization might lead to formation of vesical or vaginal calculi.

Following hysterectomy for rupture of the uterus, the bladder fistulae (caused by indirect trauma) may be seen mostly in the anterior vaginal wall unlike those resulting from direct surgical trauma during hysterectomy for fibroids, etc. in which case the fistulae are located at or near the vaginal vault (Rao, 1967). Complete perineal tear (or R.V.F.) and perineal palsy caused by obstetric trauma is seen in 7 to 15% of bladder fistulae (Table III).

The diagnosis of urinary fistulae is easy from the history and vaginal examination. They may be easily visible exposing the bladder mucosa or may be confirmed by passing a urinary metal catheter into the bladder. Incidentally this helps in detecting the urethral patency or even an occasional vesical calculus. It is only in small fistulae or those at the vault that the methylene blue test is indicated.

No fistula is tackled till atleast 8-12 weeks have lapsed after the delivery or surgery. Anaemia and local infection if any, is corrected. The excoriation of the

TABLE III
Associated Lesions in Vesicovaginal Fistulae

	No. of cases	Per cent
Complete perineal tear	22	7.28
Rectovaginal fistulae	7	2.32
Cervical lesions (Torn cervix: 38; No cx. 1) ..	39	12.91
Destruction of the urethra	23	7.62
(Partial 9; Total 14)		
Avulsed urethra	14	4.64
Blocked urethra	16	5.3
Vesical calculus	8	2.65
Perineal palsy	15	4.97
Prolapse uterus	4	1.32
	148	

vulva is treated by application of zinc cream and constant change of pads. All these cases have to be carefully examined in the theatre in lithotomy and slight Trendelenberg position, to plan the type of operation and also to check on the mobility of the cervix and the location and margins of the fistula. One fistula varies from another regarding its size, situation, scarring, accessibility, availability of tissues for closure and other associated lesions. So the strategy has to be always planned beforehand as for other plastic surgical procedures. Intravenous pyelography is needed when the ureteric orifices are close to the fistulous margins, when there is vesical calculus or infection and when there is a large irreparable fistula which might need diversion of the urinary stream.

It is possible to tackle almost all bladder fistulae vaginally under regional anaesthesia with patient in lithotomy position. Continuous suction is helpful to keep the field dry. Perineotomy or Schuchardt's incision is made whenever necessary to make the fistula more acces-

sible. Flap splitting operation is the one of choice starting from the posterior margin of the fistula and the angles before dissecting its anterior margin. Good mobilisation, haemostasis and closure of the bladder in 2 layers with interrupted No. 000 chromic catgut contributes to better results. Paring the edges and sacrificing the available bladder or vaginal tissues does not improve the end results. The direction of the closure depends on the size and direction of the fistula though at the bladderneck longitudinal closure may minimise the chances of residual stress incontinence. The bladder is drained continuously for 2 weeks. Later the patient is encouraged to empty the bladder frequently till the bladder tone is regained fully. In juxtacervical or vesico-cervical fistulae, a transverse incision is made at the vaginocervical junction and the anterior vaginal wall with the bladder is pushed well above the level of the fistula (if necessary by cutting with the scissors around the fistula). The upper margin is well mobilised before the closure is attempted. High vesico-cervical fistulae

are often associated with cyclical haematuria or menouria and require abdominal repair. These may follow a classical or lower segment caesarean section with a vertical more often than transverse incision (Falk and Tancer, 1956; Yousef, 1957; Rao, 1961). We have had a case of vesico-cervical fistula following a forceps delivery associated with cervical tear. In most of these cases, intraperitoneal extravesical repair results in a cure.

In all cases of bladderneck fistulae, blocked or avulsed urethra and whenever urethroplasty is planned, a preliminary vaginal cystotomy is performed and the bladder is drained with a Foley's catheter before commencing the dissection proper. A fine urethral catheter is used, not for drainage but only to keep the urethra patent during the first 2 weeks after the repair. This reduces the pressure on the suture line and helps healing. Two weeks later the Foley's catheter is removed in the theatre and the bladder drainage is maintained for 4 to 5 days more per urethra.

The reconstruction of the urethra with a U-shaped flap with strengthening of the bladderneck simultaneously is required in all cases where the urethra is destroyed. Moir (1964) and Hamlin and Nicholson (1969) have described a large series of such cases. To reinforce the repair the Martius graft or the Gracilis was used by these authors in several patients. Residual stress incontinence was seen in 16%. Gray (1968) reported urethrovaginal fistula and destruction of the urethra mostly following gynaecological operations. We have no experience with the Gracilis transplant but have used the procedure advocated by Martius in over 20 urinary fistulae with good results. In large fistulae where there is prolapse of

the bladder mucosa, one has to look for ureteric orifices near the margin of the fistula and the repair has to be done keeping the ureteric catheters in position and bringing them out through the urethra to avoid ureteric injury or ligation. A careful and patient dissection is needed in these cases as there may be some haemorrhage during the operation or rarely in the postoperative period. The circumferential fistula (Moir, 1965) where there is loss of tissue around due to sloughing not only on the vaginal side but on the pelvic side too with fibrosis, extra skill is required to close it successfully. In these cases again, to cover the defect in the vagina the labial fibro-fatty tissue or musclegraft would be extremely useful. The post-hysterectomy fistulae at the vaginal vault may be repaired by the flap splitting method if there is mobility. Traction with a Foley's catheter passed through the fistula is helpful during the repair. A four quadrant flap around the fistula may have to be reflected and mobilised before repairing it in layers. We have found modified Latzko's closure useful in 4 cases of vault fistulae associated with scar tissue fixation. This may cause a slightly shallow vagina but restores the bladder function remarkably.

There were 8 cases with vesical calculi in our series of urinary fistulae. They need a more detailed study of urinary tract including the renal function pre-operatively. It is better to remove the calculus vaginally or suprapubically depending on its size, incising at the same time any scar tissue which might have contributed to urinary stasis. Six to eight weeks later after the urinary infection has cleared, the fistula could be repaired vaginally. In 4 other cases, the bladder fistula was associated with genital prolapse. In all of them, vaginal

hysterectomy with repair of the fistula and the pelvic floor was done.

Stress incontinence following the fistula repair is seen in about 5% of cases. If it should persist for over 3 months in spite of physiotherapy, strengthening of the bladderneck could be done vaginally provided there is no appreciable scarring.

(Lazarus, 1959; Devi, 1965; Naidu, 1962; Moir, 1973). Yennen and Babuna (1965) reported an incidence of 17.7%. Out of our 293 cases, the transplantation of the ureters into the sigmoid was done in 3. Perhaps in 3 to 4 more of the failed cases, this procedure could have brought relief to the patient (Table IV). Large fistulae

TABLE IV
Results of Treatment of Vesicovaginal Fistulae (297)

Operation	Successful	Failed
Repair		
I	255 (86%)	
II	18	
III	5	
IV	3	
Total	281 (94%)	13
Transplantation	3	
Refused operation	1	
Residual stress incontinence	27	

When vaginal repair is not possible, the disability may be corrected by cystopexy.

The abdominal repair of vesical fistula is indicated extremely rarely. Mahfouz (1957) in his vast experience of about 1000 bladder fistulae found that whenever he failed to close the fistula from below, he failed to do so per abdomen too, because of the dense scarring. We have found the dissection in such cases extremely difficult and closure unsatisfactory. For high vesico-cervical fistula where the cervical mobility is restricted, abdominal repair is indicated.

Urinary diversion should be the last resort in the management of these cases. Some of the apparently irreparable bladder or urethral fistulae could be closed surprisingly if not at the first attempt at least after one or two more. Diversion of the urinary stream has been reported in about 3 to 4% of vesico-vaginal fistulae

where repeated attempts fail or in spite of closure there is a severe residual stress incontinence, ureterocolic anastomosis is required. Both the ureters could be transplanted during the same sitting. Upadhyay and Chari (1964) reported 20 cases of irreparable fistulae treated by uretero-sigmoidostomy. Colpocleisis is not the treatment for urinary fistulae. Bastiaanse (1954) advocated this procedure only for very large fistulae of bladder and the rectum where repair is not possible.

The cure rate for repair of bladder fistulae varies from 77.5% (Yennen and Babuna, 1965) to 96% (Lazarus, 1959). Though we have successfully closed the fistulae in 94% of our series, the first attempt was successful in 86% only. In the multiparous women with live children, tubal sterilisation through the posterior cul-de-sac could be done simul-

taneously with the repair. As most of these cases are primiparous with bad obstetric history, they need a careful prenatal care in subsequent pregnancies. If the cervix is torn or damaged earlier there is a risk of midtrimester abortion. A scarred cervix, narrow vagina, presence of cephalo-pelvic disproportion or a fistula closed with difficulty or with urethroplasty may necessitate hospitalisation from 34 or 36 weeks of gestation and an elective caesarean section at term. However, in those with no appreciable vaginal scarring or any other obstetric indication for a caesarean delivery a careful vaginal delivery may be permitted under the vigilant eye of the obstetrician provided there is no delay in the second stage of labour. The incidence of caesarean section following successful vaginal repair of a bladder fistula varies from 52% (Devi, 1961) to 72% (Lazarus, 1969).

Fortunately, the ureterovaginal fistulae are rare and form hardly 2% of the urinary fistulae. Mostly they result from direct trauma by ligation or section during hysterectomy (abdominal more often than vaginal) and rarely during the Manchester repair. The incidence is less than 0.5% of major gynaecological procedures. It is higher following radical surgery for cancer cervix due to a greater risk of avascular necrosis or direct trauma. It varies from 10% to 13.4% (Megis, 1958; Calame and Nelson, 1967; Fujiu *et al*, 1972) after radical abdominal surgery to 1.25% with the Mitra's operation (Ghosh, 1960). Inguilla and Cosmi (1967) reported genital fistulae in 6% (2.4% vesicovaginal, 1.6% ureterovaginal and 2% rectovaginal fistulae) of 1000 consecutive Schauta-Americh operation for cervical carcinoma. The incidence increases with the extent of the lesion, the

surgical skill, the amount of destruction of the ureter and preoperative irradiation. The ureterovaginal fistula may rarely follow caesarean section or rupture uterus when the incision or tear involves the uterine artery resulting in a broad ligament haematoma (Lawson, 1968). The dribbling sets in earlier in the second week if it is due to ligation or in the third week or later if it is of ischaemic origin.

The diagnosis of ureterovaginal fistula could be suspected from the history, location of the fistula and methylene blue test and confirmed by indigocarmine injection, cystoscopy and passing an ureteric catheter through the fistulous opening. An intravenous pyelography and assessment of renal function is always needed preoperatively in these cases.

Surgery is undertaken following an interval of 6 to 8 weeks after the operation which caused the fistula. Though ideal treatment is uretero-neocystostomy, the procedure might need a modification depending on the site of ureteric injury and the extent of mobilisation of the ureter and the bladder, possible for this repair. If the injury is higher, Boaris' operation using a bladder flap for ureteric anastomosis is preferable to the end-to-end anastomosis. The transplantation into the colon is done when other procedures are not practicable.

Rectovaginal fistulae are rarer in our country than the urinary fistulae and are caused mainly due to incomplete healing of a third degree perineal tear. Occasionally, it is due to compression of the presenting part or instrumental injury during labour. Other etiological factors are gynaecological operations (like colpoperineorrhaphy, total or radical hysterectomy), pelvic abscess, lympho-

granuloma venereum, pelvic malignancy and irradiation. After treating the infection, the fistula is repaired vaginally. If it is low down near the anal sphincter, which is often damaged, it is better to convert the fistula into a complete perineal tear and close it in layers. If the sphincter is intact, the posterior vaginal wall is reflected well above the level of the fistula and the closure is done carefully. Schuchardt's incision may be necessary if there is marked scarring or narrowing of the vagina. Preliminary colostomy is required for all fistulae involving the upper 1/3 of the vagina, over 1 cm. in diameter and associated with fibrosis or rectal stenosis. Prior to any attempt at abdominal repair of the rectovaginal fistula, a colostomy (preferably in the transverse colon) is indicated. Before finally closing the colostomy, a complete closure of the fistula should be confirmed by methylene blue introduced per rectum.

Combined fistulae (vesical and rectal) form 3 to 4% of any large series of urinary fistulae. If both could be easily repaired they are tackled at the same sitting starting with the bladder fistula. In these, the bladder fistula only should be attempted first and the rectal fistula subsequently. If both are irreparable, a preliminary colostomy is done followed by the repair of rectal fistula. Later closure of the colostomy and transplantation of the ureters may be carried out. Vaginal delivery may be allowed following repair of the rectovaginal fistula unless there is marked vaginal stenosis.

Enterovaginal fistula is very rare and may follow bowel injury during vaginal surgery. It may give rise to irritation of vagina and vulva besides emaciation of the patient due to loss of nutrients (Herbut, 1953). Treatment is surgical

closure per abdomen. Uterocolic fistulae due to malignancy or radiation may be seen very rarely.

Uteroperietal or uterocutaneous fistula following ventrifixation was first reported by Bircher (1910). Poddar (1951) reviewed 36 cases of these fistulae and found that 95% followed classical caesarean section mainly due to postoperative infection or use of non-absorbable sutures. It may also follow myomectomy and ventrifixation (Case, 1958). Such fistulae are no doubt rare these days for obvious reasons. Surgical excision of the fistulous tract and repair gives satisfactory results.

Genital fistulae are mainly caused by trauma due to neglected obstetrics or gynaecological surgery and rarely follow infections and pelvic irradiation. With improved health education or organisation of MCH services and better prenatal and intranatal care these fistulae are becoming rare. During surgery too, a little extra care to avoid injury to these organs, and if it should occur accidentally a meticulous repair contribute to the prophylaxis of this problem.

References

1. Bastiaanse, Van B. M. A.: Proc. Roy. Soc. Med. 47: 610, 1954.
2. Bircher (quoted by Poddar, D. L.).
3. Case, T. C.: Obst. & Gynec. 12: 233, 1958.
4. Calame, R. J. and Nelson, J. H.: Arch. Surg., 94: 876, 1967.
5. Falk, H. C. and Tancer, M. L.: Am. J. Obst. & Gynec., 71: 97, 1956.
6. Foda, M. S.: J. Obst. Gynec. Brit. Emp., 66: 372, 1959.
7. Fujiu, T., Matsuzaki, H. and Sugi, N.: J. Jap. Soc. Cancer Therap., 7: 25, 1972.
8. Ghosh, T. K.: J. Obst. & Gynec. India, 10: 287, 1960.
9. Gray, L. A.: Am. J. Obst. & Gynec., 101: 28, 1968.
10. Hamlin, R. H. and Nicholson, E. C.: Brit. Med. J. 2: 147, 1969.
11. Herbut, P. A.: Text Book of Obst. &

- Gynec. Patho. P.: Lea and Febiger, Philadelphia, 1953, p. 341.
12. Inguilla, W. and Cosmi, E. V.: *Am. J. Obst. & Gynec.* 99: 1078, 1967.
 13. Lawson, J. B.: *Obstetrics and Gynaecology in the tropics and developing countries*, ed. Lawson, J. B. and Stewart, D. B., Edward Arnold Ltd., London, 1967.
 14. Lazarus, H. M.: *J. Obst. & Gynec. India* 10: 1, 1959.
 15. Mahfouz, N.: *J. Obst. Gynec. Brit. Emp.* 64: 23, 1957.
 16. Mallika, P. E.: *J. Obst. & Gynec. India*, 24: 36, 1973.
 17. Masee, J. S., Welch, J. S., Pratt, J. H. and Symmonds, R. E.: *J.A.M.A.*, 190: 902, 1964.
 18. Meigs, J. V.: *Surgical Treatment of Carcinoma Cervix.*: Grune and Stratton, London, 1954.
 19. Moir, J. C.: *J. Obst. Gynec. Brit. Emp.*, 71: 349, 1964.
 20. Moir, J. C.: *J. Obst. & Gynec. India*, 15: 441, 1965.
 21. Moir, J. C.: *Vesico vaginal fistula*, 2nd edn., Bailliere Tindall and Cassel, London, 1967.
 22. Moir, J. C.: *J. Obst. Gynec. Brit. Cwlth.*, 80: 598, 1973.
 23. Naidu, P. M. and Krishna, S.: *J. Obst. Gynec. Brit. Emp.* 69: 311, 1962.
 24. Poddar, D. L.: *J. Obst. & Gynec. India* 2: 108, 1951.
 25. Rao, K. B.: *J. Obst. & Gynec. India* 11: 456, 1961.
 26. Rao, K. B.: *Intern. Surgery* 475: 451, 1967.
 27. Rao, K. B.: Paper presented at Vth Asian Congress of Obst. & Gynec., Jakarta, 1971.
 28. Rao, K. B.: *J. Obst. & Gynec. India*, 22: 536, 1972.
 29. Serafino, Y., Tasson and Mensah, A.: *Gynec. & Obst.*, 67: 329, 1968.
 30. Sims, J. M.: *On the treatment of vesico-vaginal fistula*, Blanchard and Lea, Philadelphia, 1853.
 31. Upadhyay, S. N. and Chari, K.: *J. Obst. & Gynec. India* 14: 568, 1964.
 32. Yennen, E. and Babuna, E.: *Obst. & Gynec.* 26: 219, 1965.
 33. Yousef, A. F.: *Am. J. Obst. & Gynec.* 73: 759, 1957.