

Repair of Vesico-Vaginal Fistula

EDWARD C. HILL, M.D., San Francisco

THE FOUNDATION of gynecologic practice, as it is known today, was laid on the cornerstone of a technique for the almost uniformly successful repair of vesico-vaginal fistulas. Over a hundred years ago, Sims⁹ reported an 83 per cent cure rate in a series of 261 cases. In Sims' day, more than 85 per cent of fistulas were obstetrical in origin—most of them resulting from pressure necrosis of the bladder wall secondary to impacted fetal heads in bony dystocia problems. Few of them were due to traumatic delivery methods. Today, with early recognition of cephalopelvic disproportion and the increasing use of cesarean section, the incidence of vesico-vaginal fistulas of obstetrical origin has been sharply reduced.

It is well recognized that the most common cause of vesico-vaginal fistulas today is gynecological surgical operation.^{1,3,6} That the impetus for the development of modern pelvic operations should have been a condition which is now frequently the result of such operations is an unfortunate medical paradox. Because of this, it is considered important to: (1) note the incidence of vesico-vaginal fistulas in a modern hospital setting; (2) determine the causes; (3) suggest methods for avoiding bladder injury at the time of operation; and (4) review the results that have been obtained with various surgical techniques for the repair of these fistulas.

MATERIALS AND METHODS

This study represents a review of the case histories of 113 patients admitted to or discharged from the University of California Hospital, with a diagnosis of vesico-vaginal fistulas, from 1932 through 1959. Many of these patients were referred from areas throughout Northern California, although approximately 15 per cent of the fistulas occurred as a result of procedures carried out at U. C. Hospital, primarily in the treatment of pelvic malignant disease.

The causes of these fistulas were analyzed and the methods of management were reviewed. Particular attention was paid to those patients in whom surgi-

• One hundred and thirteen patients with vesico-vaginal fistula were seen at the University of California Hospital from 1932 through 1959. The most common cause of fistula was trauma associated with pelvic operation, and the operation most often involved was total abdominal hysterectomy. Malignant disease of the pelvic organs was the second most common cause, while radiation therapy and obstetrical causes were next in the order of frequency.

Three fistulas healed spontaneously. Twelve bladder by-pass operations were done and 54 repairs were carried out in 46 patients. Thirty-eight patients (82.6 per cent) were cured after one or more repair operations. A variety of operative approaches were used, selected in accordance with the needs of the individual case. Bladder distention postoperatively, due to a plugged catheter, was held responsible for failure of the repair in three cases, and this complication was considered preventable.

Close attention to surgical technique, the recognition of bladder injury, and proper repair at the time of operation are prime factors in the prevention of vesico-vaginal fistula.

cal repair of the fistula was carried out, and an attempt was made to determine the factors responsible for failure of repair.

FINDINGS

Etiology. Of the 113 cases of vesico-vaginal fistulas studied, 51 (46 per cent) were the result of pelvic operation and 31 of these were associated with total abdominal hysterectomy. The second most common operation associated with fistula was radical hysterectomy for malignant disease, and in the remainder of cases the lesions were related to other procedures in the pelvis, both abdominal and vaginal (Table 1).

Malignant disease involving the genito-urinary tract accounted for 38 (34 per cent) of the fistulas, while radiation therapy for malignant disease was held responsible in 11 (10 per cent). There were 11 patients (10 per cent) with fistulas of obstetrical origin, and in ten of them the lesion was associated with difficult forceps delivery. In only one did fistula occur following delivery by cesarean section.

Management. Three of the fistulas healed spontaneously, one of them being an obstetrical fistula,

From the Department of Obstetrics and Gynecology, University of California School of Medicine, San Francisco 22.

Presented before the Section on Obstetrics and Gynecology at the 91st Annual Session of the California Medical Association, San Francisco, April 15 to 18, 1962.

TABLE 1.—Causes of Vesico-Vaginal Fistulas, U. C. Hospital 1932-1959

Cause	No. of Cases	Per Cent
SURGICAL OPERATION	51	45.2
Abdominal total hysterectomy	31	
Radical (Wertheim) hysterectomy	11	
Vaginal repair	2	
Vaginal hysterectomy	1	
Abdominal subtotal hysterectomy	1	
Abdominal cervicectomy (stump)	1	
Miscellaneous procedures	4	
MALIGNANT DISEASE	38	33.6
RADIATION THERAPY	11	9.7
OBSTETRICAL	11	9.7
Difficult forceps delivery	10	
Cesarean section	1	
OTHER CAUSES	2	1.8
Granuloma inguinale	1	
Erosion of indwelling catheter	1	
TOTAL	113	100

while the other two were defects which occurred as a result of radical operation for malignant disease.

In 58 patients operative procedures of one kind or another were done for repair of the fistula. There were 69 operations done, most of them being designed to close the fistulous opening (Table 2). Twelve by-pass operations were carried out, seven by uretero-sigmoidostomy and five by ileal bladder substitution.

The vaginal approach, which was the one most often employed, was used in 40 instances. In six of these, the Latzko⁴ technique was followed. The abdominal approach was followed in ten instances—transvesical in five, and either transperitoneal or combined transperitoneal and transvesical in five. There were four cases in which a combined transvesical and vaginal approach, according to the method of Twombly and Marshall,¹⁰ was used. These were large fistulas associated either with impairment of blood supply, such as may occur following irradiation for malignant disease, or defects in which it was not possible to gain sufficient mobilization of tissue surrounding the fistula to effect closure without tension.

RESULTS

Thirty-eight of the 46 patients who underwent one or more surgical repairs were cured of their fistula. In general, the vaginal approach was more effective than the abdominal (Table 3). The Latzko⁴ technique was particularly successful. In the six cases in which it was used the fistula was closed and no further repair was necessary.

The bladder by-pass procedures were done on patients in whom it was thought that repair of the fistula was impossible or inadvisable. In a few of these cases the indication was malignant disease

TABLE 2.—Operations for Vesico-Vaginal Fistula (58 Patients, 69 Operations), U. C. Hospital, 1932-1959

Operations	No. of Operations
REPAIRS	54
Vaginal	40
Abdominal	10
Combined	4
BLADDER BY-PASS	12
Uretero-sigmoidostomies	7
Ileal bladder substitution	5
ELECTROCOAGULATION	2
BLADDER RECONSTRUCTION	1
TOTAL	69

TABLE 3.—Results of Vesico-Vaginal Fistula Repairs (46 Patients)

Approach	No. of Operations	No. Cured	Per Cent
Vaginal	40	29	72.5
Abdominal	10	6	60.0
Combined	4	3	75.0
Total	54	38*	70.4

*82.6 per cent of patients cured after one or more repairs.

TABLE 4.—Factors Contributing to Repair Failure in Vesico-Vaginal Fistula, U. C. Hospital, 1932-1959

	No. Cases
Impaired blood supply (post Wertheim or radiation) ..	3
Bladder distention postoperative	3
Persistent carcinoma	2
Trauma (vaginal examination postoperative)	1
Technical difficulties in repair	1
Unknown (poor wound healing)	6
TOTAL	16

involving the vesico-vaginal septum, but in several instances this operation was done after one or more attempts at repair had failed. Of the seven patients who had bilateral uretero-sigmoidostomy, two died of overwhelming pyelonephritis in the immediate postoperative period. Subsequently five ileal bladder substitution operations were done without that problem arising.

Factors Contributing to Repair Failure. An attempt was made to assign factors which were considered partially or completely responsible for failure of repair in the 16 operations that were unsuccessful (Table 4). In six instances no such cause could be discovered and the failure was attributed to poor wound healing. Impaired blood supply (following radiation therapy or radical hysterectomy) was considered a factor in three cases. In three others failure was related to postoperative bladder distention due to an obstructed catheter, and these were considered preventable accidents, as was the single instance of breakdown following a vaginal examination postoperatively.

Persistent carcinoma was responsible for two failures, while technical difficulties at operation prevented satisfactory closure in one patient.

DISCUSSION

There are several reasons for the increasing incidence of vesico-vaginal fistula as a complication of pelvic operations:

1. The increased emphasis on the importance of performing total rather than subtotal hysterectomy.
2. The rising use of radical operation in the treatment of pelvic malignant disease.
3. The increasing use of vaginal hysterectomy.

Fistulas that develop after radical surgical operation or extensive radiation therapy for malignant disease most often are due to tissue ischemia and necrosis related to these procedures, and are to be accepted as a part of the risk of a necessarily radical procedure. Improvements in technique have reduced the incidence of this complication, however.

Fistula following operation for benign conditions is a complication that is for the most part preventable and is the result of one or more errors in surgical technique. These are, in the order of diminishing importance:

1. Sutures for closure of the vaginal cuff or for hemostasis placed inadvertently through the bladder wall.
2. Clamps placed on the anterior wall of the vagina, inadvertently catching the bladder as well.
3. Unrecognized perforation of the bladder.
4. Inadvertent or intentional incision into the bladder.

Total hysterectomy requires considerable bladder mobilization in order to gain access to the cervix and the vagina. In operations for benign disease, use of the infrafascial technique (described by Richardson⁸) will lessen the need for bladder dissection and will reduce the risk of bladder trauma.

It is the unusual pelvic surgeon who has not at some time in his surgical experience inflicted direct trauma to the bladder, either through design or because of operative difficulties. Bladder tissue heals readily. If an injury is recognized at the time it occurs, is properly repaired and the bladder is decompressed postoperatively, it will almost always heal.

In the repair of vesico-vaginal fistulas, it is vital that all surrounding induration have subsided before surgical closure is attempted. This may require from three to six months. Collins² reported that this waiting period may be considerably reduced through the use of cortisone preoperatively. The patient should be in optimal nutritional status, and

the urine should be sterilized with appropriate urinary antiseptics. Upper and lower urinary tract studies need to be done before surgical repair.

Gynecologists, as a rule, prefer the vaginal approach. That it is desirable in most instances is supported by the results in the small series here reported. Moir⁷ reported a series of 136 cases in which repair was done through the vagina with only two failures. The Latzko partial colpocleisis operation⁴ was designed specifically for the repair of posthysterectomy fistula and is recommended only for those cases in which the defect involves the anterior wall at the apex of the vagina. It has the disadvantage of slight shortening of the vagina, however.

The transvesical suprapubic route is favored by most urologists, and it has been demonstrated that this method is feasible and safe. Miller⁵ stated that there can be no good reason to oppose any safe approach and he believes it is a good thing that the suprapubic approach has been developed.

The combined approach, using the blow-out patch technique of Twombly and Marshall,¹⁰ has proved useful, particularly in dealing with the difficult post-radiation fistulas.

Attention to detail is of extreme importance in the postoperative period, with particular attention being paid to the maintenance of bladder decompression. Three failures of repair in this series occurred as a result of obstruction of indwelling catheters, the distention of the filling bladder causing separation at the suture line.

Use of the bladder by-pass procedures is an admission of defeat in the repair of a vesico-vaginal fistula and is to be considered only as a last resort. Because of the high morbidity and, in our experience, the high mortality associated with ureterosigmoidostomy, this procedure is not recommended. Ileal bladder substitution, even though a more difficult procedure, seems preferable.

CONCLUSIONS

Pelvic surgical operation is the most common cause of vesico-vaginal fistula, and the operation of total abdominal hysterectomy leads the list. Bladder trauma, in many instances, may be prevented by paying close attention to surgical technique, particularly to avoiding involvement of the bladder when incising, grasping or closing the vaginal vault. Prompt recognition of bladder injury and proper repair at the time of operation will prevent fistula formation in most cases.

A variety of methods for the repair of vesico-vaginal fistula are available, and treatment of each case can and should be individualized. Regardless

of the technique used, the principles remain the same:

1. Maintain optimal nutritional status of the patient.

2. Allow resolution of surrounding inflammatory reaction.

3. Sterilize the urine.

4. Obtain adequate exposure.

5. Excise scar tissue.

6. Approximate broad surfaces without tension.

7. Maintain bladder decompression until union has occurred.

University of California Medical Center, San Francisco 22.

REFERENCES

1. Benson, R. C., and Hinman, F., Jr.: Urinary tract injuries in obstetrics and gynecology, *Am. J. Obst. & Gynec.*, 70:467, Sept. 1955.

2. Collins, C. G., and Jones, F. B.: Preoperative cortisone for vaginal fistulas, *Obst. & Gynec.*, 9:533, May 1957.

3. Falk, H. C., and Bunkin, I. A.: The management of vesico-vaginal fistula following abdominal total hysterectomy, *Surg., Gynec. & Obst.*, 93:404, Oct. 1951.

4. Latzko, W.: Postoperative vesico-vaginal fistulas, genesis and therapy, *Am. J. Surg.*, 58:211, Nov. 1942.

5. Miller, N. F.: Treatment of vesicovaginal fistulas, past and present, *Am. J. Obst. & Gynec.*, 30:675, Nov. 1935.

6. Miller, N. F., and George, H.: Lower urinary tract fistulas in women, *Am. J. Obst. & Gynec.*, 68:436, July 1954.

7. Moir, J. C.: Personal experiences in treatment of vesico-vaginal fistulas, *Am. J. Obst. & Gynec.*, 71:476, March 1956.

8. Richardson, E. H.: A simplified technic for abdominal panhysterectomy, *Surg., Gynec. and Obst.*, 48:248, Feb. 1929.

9. Sims, J. M.: On the treatment of vesico-vaginal fistula, *Am. J. M. Sc.*, 23:59, Jan. 1852.

10. Twombly, G. H., and Marshall, V. F.: Repair of vesicovaginal fistula caused by radiation, *Surg., Gynec. & Obst.*, 83:348, Sept. 1946.

YES ON 22

