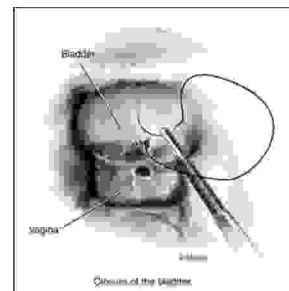


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VESICO-VAGINAL FISTULA REPAIR; UROLOGIST'S EXPERIENCE AT BAHAWALPUR.



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ABSTRACT... Objectives: To evaluate outcome of surgical repair of VVF with transabdominal and transvaginal approaches. **Design of study:** Prospective study. **Setting:** Depart of Urology Bahawal Victoria Hospital Bahawalpur. **Period:** Jan 1999 to Dec 2004. **Materials & Methods:** All consecutive patients with VVF irrespective of age and aetiology were included in this study. Patients with very large VVF and involvement of bladder neck were excluded. These patients were analysed for results of surgical repair by trans-abdominal and transvaginal approaches. **Results** This study included 26 patients with age range between 20-48 years (mean age of 34 years). Etiology of VVF was observed to be transabdominal hysterectomy in 15 patients, transvaginal hysterectomy in one patient. While obstructed prolonged labour caused VVF in 10 patients. Transabdominal repair was done in 18 patients while 08 patients have undergone transvaginal repair after investigations and evaluation. We achieved 94.45% success with transabdominal repair of VVF while 100% success with transvaginal repair. **Conclusions:** The etiology of this disease is preventable. It is best to wait for at least 03 months after occurrence of VVF, so that inflammatory changes due to previous surgery /birth trauma may have settled completely before attempting at repair. Best results are achieved at first attempt of repair. Both approaches of surgical repair of VVF have good results.

Key words: Vesicovaginal Fistula, Transabdominal Repair, Transvaginal Repair.

INTRODUCTION

Fistula is defined as an abnormal communication between two or more epithelialized surfaces. Vesicovaginal fistula is an abnormal fistulous communication tract between vagina and urinary bladder, which leads to continuous involuntary passage of urine into vaginal vault. Vesicovaginal fistula, with incontinence, constant odour and scalding is most

embarrassing social stigma for any woman. The existence of VVF as a clinical entity is believed to have been known to physicians of ancient Egypt with examples present in mummies from 2000 BC¹. The etiology of vesicovaginal fistula is varied and broadly categorized into congenital and acquired. Acquired fistulae are divided into obstetrical, surgical, post radiation, malignancy and miscellaneous. In third world

countries over 90% of fistulae are of obstetrical origin where as in the UK and developed nations these are usually unfortunate complications of gynaecological or other pelvic surgery. Fistula can be simple where tissues are healthy and access is good or complicated where tissue loss is more, access is impaired or ureteric orifices are involved. True incidence of VVF is not known^{2,3}. The frequency, etiology and presentation of VVF differ from country to country and within various regions of the same country^{4,5}. The first successful management of VVF was achieved by John Fatio in 1675, while Sims, the father of surgery, performed VVF repair successfully in 1849 with silver wire sutures. James Marion Sims started routine use of bladder drainage catheter in fistula repair^{6,7,8}.

VVF resulting from obstructed labour is still a major frustrating problem in developing countries and surgical cure was thought to be non-existent. The management of VVF remains controversial as regard to time and surgical approach^{9,10}.

PURPOSE OF STUDY

This prospective study was conducted at the Department of Urology, Bahawal Victoria Hospital, Quaid-e-Azam Medical College, Bahawalpur during the period from Jan 1999 to Dec 2004 for evaluation of outcome of surgical repair of VVF with transabdominal and transvaginal approaches.

PATIENTS&METHODS

Patients included in this study were those who were diagnosed to have vesicovaginal fistula alone or concomitant ureteric fistula irrespective of age and etiology. Patients excluded from the study were those with very large defect involving whole of the posterior wall of urinary bladder or bladder neck and urethra which require urinary diversion or ileocystoplasty.

Period of presentation: The patients having urinary incontinence after any obstetrical or gynaecological etiology mostly presented to us between one month to one year after occurrence of the event. One patient presented after 15 years of previous two failed repairs by gynaecologist.

ETIOLOGY

Mainly patients presenting with VVF were having gynecological surgery especially transabdominal hysterectomy as an offending event. Second most common obstetrical reason was prolonged labour and instrumental delivery. We have not observed post radiation, tuberculous, or foreign body fistulae in our unit.

Table-I.

Etiology	No of pts	%age
Transabdominal Hysterectomy	15	57.69%
Transvaginal Hysterectomy	1	3.84%
Obstructed labour	10	38.46%

INVESTIGATIONS

Patients admitted with VVF were subjected to laboratory investigations like complete blood count, routine urine examination, serum creatinine, ultrasonography abdomen for upper urinary tract and other abdominal viscera, excretory urography was required in those patients whose ultrasonography showed ureteric obstruction and hydronephrosis, in order to evaluate functional status of that particular renal unit. Cystoscopic examination was performed in every patient with suspected VVF under intravenous sedation for visualization of exact site and size of VVF and its relation to ureteric orifices and bladder neck. In cases with suspicion of ureteric injury or sonographically obstructed ureter, retrograde ureteric catheterization attempted to localize site of obstruction and retrograde urography was obtained. The ureteric catheter was retained in cases of ureterovaginal fistula if obstruction was bypassed successfully. Retrograde urography was performed to check correct placement of retrograde catheter. At the time of cystoscopy, speculum examination of vagina was also done for localization of vaginal opening of fistula, so as to decide route of repair. If fistula was sited at trigone or between trigone and bladder neck on cystoscopy and in lower 1/3 rd of vagina on speculum examination, vaginal route of repair was opted. If fistulous defect was large, supratrighonal, with or without ureteric involvement on cystoscopy and at vaginal vault on speculum examination then transabdominal route of repair was

opted.

TIMING OF REPAIR

The minimum time lapse between occurrence of fistula and repair was 06 months. This allowed maturation of tissues and fistula tract, settling of inflammation and recovery from previous surgical catabolism. Although this long time from the occurrence of fistula causes much social embarrassment to fistula patients. A failed attempt at repair due to earlier repair cause fistula patients more catastrophe than first successful repair. The best outcome in any fistula repair surgery is achieved at first repair. That is why time allowed between occurrence of fistula and repair compensates by its results. The symptom free, dry patient is much happier than a patient with failed attempt at repair due to early repair, from the time of occurrence.

PROCEDURAL DETAILS

Abdominal repair was transperitoneal, transvesical. Extraperitoneal transvesical repair was not done in any case in our unit. Transabdominal, transperitoneal repair gives adequate exposure of involved organs and dissection becomes easier due to maximum exposure. It also provides chances of ureteric reimplantation if required. The type of ureteric reimplantation practiced at our department is modified Leisch technique using the spatulated ureteric lower ends and tunnel formed by seromuscular layer. The mucosal opening at the distal end of tunnel harbors the reimplanted spatulated end hanging in the bladder with anchoring stitches. Seromuscular tunnel is closed over the ureter. This technique has so far produced exceptionally satisfactory results. We routinely insert double pigtail ureteral stent in ureteric reimplantation. The stent is removed endoscopically after 06 weeks of repair.

A: TRANSABDOMINAL, TRANSPERITONEAL, TRANSVESICAL REPAIR OF VVF;

Patient's position remains supine with 30 degree head down tilt. Abdomen is opened through the suprapubic midline incision. The urinary bladder is opened from peritoneal surface vertically down to fistula site. The bladder is separated from anterior vaginal wall with sharp

dissection keeping blunt dissection to minimum. The fistula margins are freshened and assessed for adequate tension free repair. Both ureters are temporarily stented with silastic 6Fr. tubes before embarking on repair. The vaginal wall is repaired with Vicryl 2/0 suture in transverse manner in double layer. The bladder wall repair is started from fistula site upwards. Double layer repair is done at 90 degrees to vaginal repair with vicryl 2/0 suture. Both ureteric tubes mobility is checked to ensure patency of ureters and tubes are removed before completion of bladder repair. A large bore Foley's catheter is passed as cystostomy through a separate stab in bladder. Pelvic drain is placed before wound closure after checking for hemostasis and removal of all packs placed. Per urethra Foley's catheterization is done at the end of procedure. Pyodine soaked gauze is placed into vagina which is removed on 1st postoperative day. Cystostomy is clamped on 7th postoperative day and removed on 10th postoperative day. Per urethra Foley's is removed on 14th to 20th postoperative day. Anticholinergic drugs may be required in few patients to prevent bladder spasm.

B; TRANS VAGINAL REPAIR OF VVF:

The patient is positioned in modified Jack Knife position with head down tilt of 30 degrees. (Reverse Lithotomy Position). Few patients require ureteric temporary stenting with ureteric catheter due to close proximity of fistula to ureteric orifices before turning the patient to reverse lithotomy position. Fistula site is exposed with vaginal retractors. Fistula margins are infiltrated with Adrenaline + Normal saline solution 1: 100,000 concentration and circumferentially incised. Vaginal wall is dissected free of urinary bladder wall. The fistula margins are freshened; not excised. The bladder wall is closed in double layer with vicryl 2/0 suture. Vaginal wall closed with same suture material at 90 degrees to bladder repair. After completion of repair per urethra catheterization is done. Saline and methylene blue solution is instilled in the bladder through the catheter to check for any leak. Urethral catheter is removed on 10-14th postoperative day.

POST OPERATIVE MANAGEMENT

In every VVF repair, postoperative care is very important because negligence in postoperative management can easily distort what the surgeon has achieved at

operation. Free drainage of cystostomy and per urethra catheters is of utmost importance. Vital Signs records are maintained along with urine output record. Adequate intravenous fluid replacement in first few days is mandatory to maintain adequate urine output. Early mobilization in bed and oral clear liquids are allowed as soon as bowel starts functioning. Post operative antibiotics cover is aimed at Gram negative organisms and anaerobes (vaginal microflora). Vaginal packs, if any are removed after first 24 hours. Irrigation of urinary bladder with normal saline may be required in some cases due to haematuria. It should be very slow and if urine remains clear it should be stopped at 24–48 hours. Anticholinergic drugs are required in few patients to prevent bladder spasm. If somehow catheter becomes blocked, very gentle active flushing is performed in early postoperative period. No forceful flushing is recommended. The purpose of keeping both cystostomy and urethral catheter is to allow free drainage of urine if one of the catheters becomes blocked. The cystostomy is removed first on 10th postoperative day after clamping started on 7th postoperative day. Pelvic drains removed on cessation of drainage, usually 48-72 hours after operation. Urethral catheter is kept for 14th to 20th days. The patients are observed for 24-48 hours after removal of urethral catheter, for any complaints. Patients are discharged with advice of fortnightly followup for 03 months and then three monthly.

RESULTS

Total number of patients in our study was 26. The age range of patients with vesicovaginal fistula was between 20-48 years with mean age of 34 years. Sixteen patients (61.54%) were having gynaecological surgery as etiological factor. Out of these, 13 patients (81.25%) had transabdominal hysterectomy done at periphery in less than ideal circumstances and skills. Two patients (12.50%) developed VVF after transabdominal hysterectomy at tertiary care units. One patient (06.25%) developed VVF after transvaginal hysterectomy. Five patients (19.23%) were referred to our unit after unsuccessful repair by gynaecologists. Ten patients (38.46%) developed VVF due to obstetrical reasons of prolonged obstructed labour. Non-qualified health workers at villages or suburban areas mishandled these patients. One of these patients had instrumental delivery

and developed VVF.

All of these VVF patients presented between one month to 15 years after the development of this unwanted event of VVF. Delayed presentation was due to previous failed repairs and disappointment from cure by surgical means.

The size of fistula recorded in our study was between 0.8-4.5cm. Majority of patients were having fistula of >2cm size. After evaluation, 18 patients (69.23%) were found to have supratrighonal (high) fistulae and were offered transabdominal, transvesical repair. Eight patients (30.77%) were having subtrighonal or trighonal fistulae proximal to bladder neck and were offered repair by vaginal route. We have achieved 100% success rate by pervaginal route. Although the preferred approach by Urologist is transabdominal transvesical, we achieved 94.45 % success by this route with one failure (5.45% acceptable failure rate). The catheter drainage was continued upto 10 days on average in vaginally repaired fistulae while 14-18 days in abdominally repaired fistulae.

Table-II. Type of Repair

Type of Repair	No of Pts	%age
Transabdominal	18	69.23%
Transvaginal	8	30.77%

Table-III. Complications

Complications	Transabdominal Repair	Transvaginal Repair
Lower abdominal pain	5	1
Prolonged ileus	4	0
Bladder spasm	7	3
Hematuria/clot retention	1	1
Recurrence	1	0

The complications during immediate postoperative period were bladder spasm controlled with anticholinergic drugs. Among the patients with abdominal repair, four patients developed prolonged ileus which recovered conservatively within 72 hours of surgery. One patient

each with transabdominal and transvaginal repairs had clot retention in first postoperative day, which was cleared with active gentle flushing with normal saline. The same patient with transabdominal repair later on developed recurrence, the only failure of our study.

DISCUSSION

The occurrence of vesicovaginal fistula is almost obsolete in developed countries while still a reasonable size of population faces the problem in underdeveloped nations. The obstetrical causes are commonest etiological factor in third world causing destruction of bladder base and urethra with compression against pubic bone during prolonged obstructed labor, instrumental deliveries or handling by untrained birth attendants^{9,10}. Vesicovaginal fistula in developed countries mostly occurs after pelvic surgery i-e Abdominal hysterectomies, which occur in 0.05-0.5/100 cases³. The obstetric etiology of VVF in developing countries is almost 70-95%^{3,4,5}. In Pakistan studies conducted at different centres have shown that 53.3%-89.4% cases of VVF are due to complication of difficult labor^{10,11,12}. In our study the cause of VVF was abdominal hysterectomy in 15(57.7%)patients and obstructed labour in 10(38.3%)patients. Although these statistics are different from previously recorded in our country^{5,10,13-17}. The causative factors are performance of hysterectomies in periphery by non qualified persons with own learned techniques, leading to increased number of post hysterectomy VVF patients. As these studies are from the Urologist point of view and can be different from studies conducted by gynecologists. The previous obstetrical history, parity were of least importance for a Urologist. This study mainly stressed over comparison of outcome following the repair with abdominal or vaginal route after the diagnosis of VVF, whatever may be the cause.

In diagnosis of VVF, it is important to confirm that discharge is urine and leakage is extra-urethral. There is difference of approach in diagnosing the VVF. Although previous history and presentation gives clue to the diagnosis but gynaecologists claim dye test as an investigation of choice¹⁸. In our study diagnostic test was examination under sedation including cystoscopy and speculum examination of vagina. Ureteric involvement

only considered when patient is having normal voiding along with incontinence and ultrasonography showing hydroureter. Ureterovaginal fistula has been associated with VVF in 10% of cases¹⁹. Three-swab test has its limitations and not recommended, the examination is best carried out by direct inspection²⁰.

We confirm ureterovaginal fistula by retrograde ureteric catheterization and urography. The size of VVF was approximately between 08mm to 45mm. Almost similar measurements between 05mm-35mm have been reported in National and Internationally conducted studies^{5,16}. Age of patients affected by VVF vary greatly between country to country and even in different regions of same country. Our study observed age range between 20 to 48 years (mean age 34Years) while age in different international studies is between 17 to 80 years^{16,21-24}. The age recorded in studies in different regions of Pakistan varies between 13-55 years in Sindh¹⁰, 25-45 years in Lahore⁵. In African countries, the younger age group of women is affected with VVF and this is due to early marriages⁵.

The timing of repair after the occurrence of VVF is the most controversial aspect of repair surgery of VVF. This contentious aspect of fistula management for shortening of waiting period is of both social and psychological benefit to what are always very distressed patients. One must not trade these issues for compromise to surgical success. Although early repair is now being advocated by some authors²⁶⁻²⁸, but most would agree that 8-12 weeks after VVF occurrence is the earliest appropriate time to repair. Pressure from patients for earlier repair should be resisted and 08weeks is minimum time allowed between attempt at repair and VVF occurrence²⁹. Time allowed in different studies vary between 03-06 months. In our study minimum time lapse was 03 months. As first attempt is best, with success rate ranging from 45-97%^{23, 30-31}.

Surgeons involved in fistula repair management must be capable of both vaginal and abdominal approaches. As the arguments of earlier intervention and success rate have little merit as both approaches have their place³²⁻³⁵. Vaginal repair is applied where access is good, tissues are sufficiently mobile. Abdominal repair is done where

access is poor per vaginally and fistula can not be brought down and concurrent involvement of ureter is there. Overall most surgical fistulae likely to require abdominal repair while obstetrical fistulas are dealt satisfactorily by vaginal route³⁶⁻³⁹. The transvaginal approach to close VVF is of advantage, avoiding an abdominal incision and reducing post-operative morbidity⁴⁰. The transvaginal approach is more amenable to an early repair and is accompanied by a 90% or higher success rate⁴¹. There is increasing tendency for earlier repair instead of delayed. It is important to follow the principals of fistula surgery to achieve success. Early treatment with good technique regardless of approach guarantees a high success rate²⁵. The success of VVF repair should be regarded as disappearance of fistula. Vaginal repair success rate claimed in different studies is 66.7% to 95%^{5,10,22,42,43}. Success rate after abdominal repair of VVF is reported to be 85% to 100% in different studies³⁹. In our study we have practised both types of approaches with 100% success rate with vaginal repair and 94.4% with transabdominal repair of VVF.

Transvaginal approach is suitable for smaller fistula and fistula located in lower vagina. The transabdominal approach is appropriate for larger fistula, relapsing fistula and fistula located higher in bladder or when there is concomitant ureterovaginal fistula⁴². Abdominal repair can be extraperitoneal or intraperitoneal with or without omental graft. The nature of surgical approach should be decided by the location of fistula, the functional importance of the area and the degree of surgical exposure during corrective procedure^{21,43}. It is difficult to prove the superiority of one surgical technique over another due to fistula etiology, location, and clinician's expertise⁴⁴. Each fistula is unique. Surgeon will often be required to individually vary their approach and technique. The concept of using healthy tissue is tension free closure and reinforcing the closure in high-risk situation will ensure success^{23,45}. Adequate uninterrupted bladder drainage is required in both vaginal and abdominal repairs. Drainage by urethral Foley's catheter was continued upto 10-14 days in our study. Similarly various national studies report catheter removal on 14th day. Hilton-P has recommended that catheter drainage in surgical fistula repair for 12 days is adequate while for obstetric fistula 21 days drainage is appropriate^{40,46}. The

duration of bladder drainage reported in various studies is 06-42 days with mean duration of 15.8 days⁴⁷.

The follow-up period in our study was on average 24 months (12-36 months). Different studies have variable period of follow-up from 07.2 months to 35 months^{13,16,29,47}. Cure rates should be considered in terms of closure at first attempt. On average one might anticipate 80% cure with 10% failure rates^{42,43}. The success rate decreases progressively with increasing numbers of previous unsuccessful procedures. It can not be over emphasized that the best prospects for cure is the first attempt operation^{46,47}. It is clear that maternal mortality and obstetric fistula due to prolonged obstructed labour are closely related. One might look on the vesicovaginal fistula as being "Near Miss" maternal death.

CONCLUSION

Supra trigonal VVF are best treated with transabdominal transperitoneal, transvesical approach. This approach helps to treat concomitant UVF if any. It provides wide exposure of fistula site and better dissection of tissues and repair. Vaginal approach has best results in fistulae at trigone or below and proximal to bladder neck with out ureteric fistulae. Fistula surgery should be performed by the Urologist /Gynecologist who is routinely performing such operations. A well-intentioned occasional fistula surgeon is NOT justifiable. The results of VVF repair are achieved best at first attempt, so no stone should be left unturned before the repair is performed, in order to make the patient dry of persistent urinary incontinence. A successful attempt of repair will help fistula patient to be integrated in social activities as routinely as before the occurrence of the disabling event of Vesico-Vaginal Fistula

REFERENCES

1. Hilton P. **Vesicovaginal fistula: new perspectives.** *Curr Opin Obstet Gynaecol* 2001; 13:513-20.
2. Thompson JD. **Surgery of vesicovaginal and urethrovaginal fistula.** *Campbell's Urology*, 7th Edn, Ch 37;p1135-53.
3. Riley VJ, Spurlock J. **Vesicovaginal fistula.** *emedicine* [serial on line] 2001[cited October 2001]. Available from

www.emedicine.com.

4. Begum A. **Vesicovaginal fistula: Surgical management of 100 cases.** J Bangladesh coll Physicians Surg 1989; 06:29-32.
5. Maimoona H, Shaheena A, Hajira H. **Profile and repair success of vesicovaginal fistula** in Lahore. JCPSP 2005; vol 15 (3): 142-44.
6. Zacharian RF. **A history of vesicovaginal fistula.** Aust NZJ Surg 2000; 70:851-4.
7. Thompson JD. **Vesicovaginal and urethrovaginal fistulas.** In Rock JA, Thompson JD, (edi). T E Linde's Operative surgery. Vol 02, 8th edition, New York. Lippincott Ravan, 1997:1175-1205.
8. O'Connor VJ jr. **Review of experience with vesicovaginal fistula repair.** J Urol 1979; 123:354-69.
9. Elkins TE. **Surgery for the obstetric vesicovaginal fistula: a review of 100 operations in 82 patients.** Am J Obstet Gynaecol 1994; 170:1108-20.
10. Pushpa SS. **Surgical repair of vesicovaginal fistulae.** JCPSP 2002, vol 12 (4): 223-226.
11. Blaives JG, Heritz DM, and ROMNIZI LJ: **Early versus late repair of VVF; Vaginal & Abdominal approaches.** J Urol 1995; 153:1110-1113.
12. Falk HC, Tancer ML: **VVF, An historical survey.** Obstet Gynaecol 1954; 3:337-341.
13. Wein AJ, Mallory JR, Carpinello VL et al: **Repair of VVF by a suprapubic transvesical approach.** Surg Gynaecol Obstet 1980a; 150:57-60.
14. Elkin LE, Drescheer C, Martey JO, Forte D, **Vesicovaginal fistula Revisited. Obstetric and Gynaecology** 1988; 72:307-312
15. Kelly J. **Vesico vaginal fistula.** British journal of Urology, 1979; 44:623-31.
16. Elibar KS, Kavalier E et al: **Ten-year experience with transvaginal vesicovaginal fistula repair using interposition.** J Urol. 2003 Mar; 169(3): 1033-6.
17. Miller EA, Webster GD: **Current Management of vesicovaginal fistulae.** Curr Opin Urol. 2001 Jul; 11(4): 417-21.
18. Tode V, Deleanu D, and Voinea F: **The experience of our clinic in the treatment of vesicovaginal fistula.** Chirurgia (Bueur). 2001 Jan-Feb; 96(1) 101-4.
19. World Health Organization. **Maternal mortality and morbidity: Obstetric fistula.** Women's Glob Netw Reprod Rights 1991 (Oct-Dec), 37:8-9.
20. World Health Organization. **The prevention and treatment of obstet fistulae.** Report of a technical working group, Geneva, 17-21 April 1989 (WHO/FHE/89.5).
21. Farooqi MA, Ahmed A. **Vesicovaginal fistulae: experience with transcervical repair.** Pak J Obstet Gynaecol 1995; 8:9-11.
22. Parveen F Shah Q. **Vesicovaginal fistulae: a challenge for women in developing country.** J Coll Physicians Surg Pak 1998; 8:230-2.
23. Royston E, Armstrong S (9edi). **Preventing maternal deaths.** Geneva: WHO 1989.
24. Gilvernet JM, Gilvernet A, and Campos JA: **A new surgical approach for treatment of complex VVF.** J Urol 1989; 141:513-516.
25. Landes RR: **Simple transvesical repair of VVF.** J Urol 1979; 122:604-606.
26. O'Connor VJ Jr: **Review of experience with VVF repair.** J Urol 1980; 123:367-369.
27. Lawson JB. 1972: **Vesical fistula into vaginal vault.** British Journal of Urology, 44:623-631.
28. Murphy M, 1981: **Social consequences of Vesicovaginal fistula** in North Nigeria. Journal of Biosocial Sciences, 13:139-150.
29. O'Connor V, Sokol J: **VVF from the standpoint of the Urologist.** J Urol 1951; 66:367-369.
30. Hilton P, Ward A. **Epidemiological and surgical aspects of urogenital fistulae: a review of 25 years' experience in Southeast Nigeria.** Int Urogynaecol J Pelvic Floor Dysfunct 1998; 9:189-94.
31. Kam MH, Tan YH, and Wong MY: **A 12 years experience in surgical management of vesicovaginal fistulae.** Singapore Ed J, 2003 Apr; 44(4): 181-4.
32. Evans DH, Madjar S, Politano VA, Bejany DE et al: **Interposition flap in transabdominal vesicovaginal fistula repair: are they really necessary?** Urology. 2001

- Apr; 57(4): 670-4.
33. Armenakas NA, Pareek G, and FRACCHIA JA: **Iatrogenic bladder perforations; long term follow-up of 65 patients.** J Am Coll Surg 2004 Jan 198(1):78-82
 34. Tancer ML: **Observation on prevention and management of VVF after total hysterectomy.** Surg Gynaecol Obstet 1992; 175:501-506.
 35. Wall LL: **Fistula dan duniya. An African (Hausan) Praise song about vesicovaginal fistula.** Obstet gynaecol 2002 Dec; 100(6): 1328-32.
 36. Hadley HR: **Vesicovaginal fistula.** Curr Urol Rep 2002 Oct; 03(5):401-7.
 37. Rafique M: **Genitourinary fistulas of obstetric origin.** Int Urol Nephrol.2002-2003; 34(4) 489-93.
 38. Frohmiller H, Hogmockel G: **Transvaginal closure of vesicovaginal fistula.** Urology A.1998 Jan; 37(1): 70-4.
 39. Amr MF: **Vesicovaginal fistula in Jordan.** Eur J Obstet Gynaecol Reprod –Biol.1998 Oct; 80(2): 201-3.
 40. Tazi K et al: **Complex vesicovaginal fistula.** Report of 55 Cases. Ann Urol (Paris). 2001 Nov; 35 (6): 339-43.
 41. Mondel F, Conort P et al: **Anatomic and functional results of transperitoneal transvesical vesicovaginal fistula repair.** Urology 2001 Dec, 58(6): 882-6.
 42. Sefrioui O et al: **Current profile of obstetrical vesicovaginal fistula at the maternity unit of the University of Casablanca.** Ann Urol (Paris) 2001 Sep; 35(5): 276-9.
 43. Sanchez Merino JM: **Transvesical repair of non-complicated vesicovaginal fistula.** Actas Urol Esp.2000 Feb;24(2): 185-9.
 44. Hilton P. **Vesicovaginal fistula in developing countries.** Int J Gynaecol Obstet(Ireland), 2003;82:285-95.
 45. World Health Organization. **The prevention and treatment of obstet fistulae.** Report of a technical working group, Geneva, 17-21 April 1989(WHO/FHE/89.5).
 46. Moudouni S, Nauri M, Koutani A: **Obstetrical vesicovaginal fistula. Report of 114 cases.** Prog Urol.2001 Feb; 11(1): 103-8.
 47. Nanda RS. **Vesicovaginal fistulae: a 12 years study.** J Indian Med Assoc 1995; 93:93-4.

**He than has done
nothing has known
nothing**