

Diagnostic Accuracy of Trans Vaginal Sonography in Detecting Vesicovaginal Fistula

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ABSTRACT

Objective: The aim to conduct this study was to establish the diagnostic accuracy of trans vaginal sonography to detect vesicovaginal fistula. Findings are compared with cystogram and surgical results, taking later as gold standard. **Settings:** The study was conducted in the Department of Radiology, FJMU/Sir Ganga Ram Hospital, Lahore Pakistan. **Duration:** September 2022 to March 2023. **Methods:** All patients who were included in study, were married females within age bracket of 32-42 years, who presented in outpatient department with the complaint of urinary incontinence. Trans vaginal ultrasound was performed after verbal consent. Findings were compared with cystogram and surgical results, taking later as gold standard. Patients who suffered stress incontinence during physical movement or activity were excluded from this study. **Results:** A total of 25 patients were taken. The age range was 32-42years with mean age of 36years. The fistulae were seen by transvaginal ultrasound in all cases with the site, size and number of communicating tracts corresponding with operative results. Trans vaginal sonography reveals 100% sensitivity to detect vesicovaginal fistulae. **Conclusion:** We recommend transvaginal ultrasound as an accurate imaging modality for detecting vesicovaginal fistula because its findings are correlated well with the surgical results and is non-invasive, safe, non-hazardous and without any risk of radiation exposure.

Keywords: Vesicovaginal fistula, Transvaginal ultrasound.

INTRODUCTION

In patients with vesicovaginal fistula, urinary incontinence is noted as a result of pathological communication between vagina and urinary bladder. Vesicovaginal fistula leads to an unhealthy condition causing physical, social and psychological stress on patients.¹ The patient can present with complaint of variable degree of abnormal urine leak which can be different in all patients and depends upon the diameter and site of abnormal fistulous pathway between urinary bladder and vagina. If vesicovaginal fistula is large, patients have continuous leakage in contrast to small fistula in which patients have intermittent wetness which is positional. Patients can report recurrent vaginal infections and perineal skin irritation. This is a complex morbidity that not only progress to additional

complications like bladder calculi formation and local infections,² but the uninterrupted bad aroma makes patient socially unacceptable.³ Malnourishment, Poverty, illiteracy, teenage marriages, early age child bearing, long-term inserted vaginal pessaries / foreign bodies and poor post-partum facilities are the major contributing factors that lead to significantly increased chance to develop the vesicovaginal communication in poor nations across the world.⁴

Other causes of vesicovaginal fistula include complications of radiotherapy (done for cervical, endometrial and vaginal cancers), previous pelvic surgeries like hysterectomy, repair of cystocele, cancer surgeries and sling procedures. Congenital cases of vesico vaginal fistula are associated with other urogenital anomalies. In developed countries although vesico

vaginal fistula is rare, it is still a burden on patient, health providers and medical facilities.

Assessment to visualize the diameter and communicating site of fistula is crucial to decide the surgical planning and the best operative approach. Mostly single fistulous tract is formed which can be complicated in chronic cases by progressing to multiple tracts especially in patients undergoing radiotherapy after cervical carcinoma. Pre-operative diagnosis allows selection of better surgical plan. Transvaginal ultrasonography is better for visualizing site, diameter and direction of the communicating tract. Sonography with trans-vaginal approach carries no risk and proved to be non-invasive, acceptable modality with minimal side effects and is more applicable than other conventional modalities like cystogram.⁵ Recurrent fistula formation is the well-recognized complication of surgery, done for vesicovaginal fistula.⁶ Good post operative care can avoid this recurrence. Other less common complication of vesicovaginal fistula repair include stress incontinence.

The diagnostic approach includes dye test (dilute methylene blue infusion in urinary bladder after insertion of vaginal tampon), cystography, intra venous urography and clinical examination methods, which include physical examination to see associated pathologies and taking biopsies if needed, examination under general anesthesia, cystoscopy (bladder scope insertion to access urinary bladder and urethra) and colposcopy (medical examination of cervix by using a special optical instrument). MR fistulography is currently available state-of-the-art diagnostic facility,⁷ while endo-cavitary ultrasonography through trans rectal approach⁸ or trans vaginal approach which can be performed with color Doppler and dye injections, are other available modalities.⁹

The rationale to conduct this research was to find out the sensitivity of gray scale trans vaginal sonography for evaluating VVF.

METHODS

This study was conducted in the Radiology Department of FJMU/SGRH Lahore between September 2022 and March 2023. Permission from all patients, who were included in this study, was obtained in the form of written and verbal informed consent.

All females who were married, having complaint of urinary leakage with clinical suspicion of vesicovaginal fistula on the basis of examination, referred for IVU, cystography or CT urogram were included in this study.

Patients who were not consenting for TVS and those having complaint of stress incontinence were excluded from this study.

Total 25 patients were included in this study. After taking verbal consent, trans vaginal ultrasound was performed on Toshiba Applio 300 after applying aseptic measures in sterilized environment. All findings were compared with the findings of cystogram and operative results, while later taken as gold standard. On TVS, size, site and ramification of fistulous tract is noted.

RESULTS

A total of 25 patients were studied during this period of 6 months. In our study, the age range of patients was 32-42 years with mean age of 36 years. Out of 25 patients, the highest number of patients were between 34-36 years i.e. 13 (52%), 8 patients (32%) were aged between 37-42 years and 4 patients (16%) were aged between 32-33 years. The fistulae were seen by transvaginal ultrasound in all 25 cases with the site, size and number of communicating tracts corresponding with operative results. The trans vaginal sonography in detecting vesicovaginal fistula has 100 % sensitivity. Vesicovaginal fistula noted as a tract of irregular echoes extending from urinary bladder and reaching upto vagina. Single tract was visualized in 23 patients while double tract was seen in 2 patients. The fistulous tract extending from base of urinary bladder to vagina was seen in 21 patients while in 4 patients, the tract was seen extending from bladder trigone to vagina. The size of tract was measured with mean length of tract 1.5 cm while mean width of tract was 9mm. Fistulous tract was outlined in all 25 patients concluding 100% sensitivity, while on cystography fistula was appreciated in 16 out of 25 patients concluding 64% sensitivity.

DISCUSSION

Vesicovaginal fistulae are emotionally distressing condition that has serious social and quality of life implications. Among the Obstetrical causes, most important is injury due to prolonged obstructed labour, during cesarean section, and instrumental / forceps delivery^{10,2}. In developing and underdeveloped countries, where prolonged obstructed labour is a main factor of maternal mortality, the number of vesicovaginal fistula is approaching the maternal mortality rate¹¹. The obstructed fetal head during vaginal delivery cause injury to surrounding anatomical structure with resultant development of VVF. Vesicovaginal fistula is a morbid condition involving and distressing females in many poor countries of the world. The successful management of this morbid condition requires accurate and timely diagnosis. Most of these patients are approached with open abdominal surgery. Other surgical approaches to manage

these patients suffering from vesico vaginal fistula include trans perineal, trans vesical or extra vesical techniques. Surgical management include exact exposure of communicating fistulous tract, repair of urinary bladder defect. After repair, patient is catheterized for long term even up to two months, to avoid recurrence of fistula and to allow adequate and early healing of surgical bed.

Other post surgical cares include vaginal packing for few hours to secure hemostasis, application of topical estrogen for healing, post operative antibiotics to avoid infection. Recurrence rate is high in patients with complex fistulas and those who developed vesico-vaginal fistula as a complication of radiotherapy done for vaginal, cervical or endometrial carcinomas. After sixth post operative week, if urinary leakage persists, patient should be considered for surgical repair again.

Most of the patients who were included in our study were from low socioeconomic status which corresponds to the the literature finding in a study done by Michael stamatakos et al which states that unrepaired VVFs is noted in approximately three million females in developing countries¹². Moreover, the major cause of post partum vesicovaginal fistula was obstructed labour in our study, which is in accordance to the similar findings in a study by Tahzib F¹³. Vesovaginal fistula was identified in all cases (100% sensitivity) on trasvaginal ultrasound in our study which corresponds well with the study done by Saba Sohail et al¹⁴.

Transvaginal ultrasound can outline the diameter, site and direction of communicating fistulous tract while in comparison, conventional cystography is sometimes not much helpful to delineate the exact tract and associated anomalies¹⁵. In poor countries this condition prevails, remains un diagnosed and untreated for many years due to lack of awareness and medical facilities. Measures must be taken to decrease the incidence and for prevention of vesicovaginal fistula, which may include good hygiene, healthy organic food intake, advanced approachable medical facilities, higher literacy rate and betterment of women's social position with emphasis on women empowerment.

CONCLUSION

Vesicovaginal fistula developed as a complication of obstetrical and gynecological interventions, is a major psychological burden to the patients. Vesicovaginal fistula can be diagnosed on the basis of clinical assessment and radiological investigations. Trans vaginal ultrasound is proved to be 100% sensitive in detecting vesicovaginal fistula. In real time trans vaginal ultrasound, vesicovaginal fistula is seen as a tract of

irregular echoes extending from urinary bladder reaching up to the vagina. Trans vaginal sonographic findings are consistent with the surgical findings.

LIMITATIONS

There are not many limitations to this study however some patients experienced little discomfort upon insertion of Transvaginal probe.

SUGGESTIONS / RECOMMENDATIONS

We recommend transvaginal ultrasound as an accurate imaging modality for detecting vesicovaginal fistula because it involves no radiation risk.

CONFLICT OF INTEREST / DISCLOSURE

The authors declare no conflict of interest among them.

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