Profesional paper

VESICOVAGINAL FISTULA: ETIOLOGY, DIAGNOSIS, TREATMENT AND PREVENTION

Izairi A[1,3], Ivcev J[1,3], Minev I[1,3], Markovski D[2,3], Stoilkovska T[1]

[1]Faculty of Medical Sciences, University Goce Delcev Stip
[2]Medical Faculty, Saint Cyril and Methodius University, Skopje
[3]City General Hospital 8th of September Skopje, Republic of North Macedonia

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INTRODUCTION

A vesicovaginal fistula (VVF) is an abnormal fistulous tract extending between the bladder and the vagina that allows the continuous involuntary leakage of urine into the vaginal vault. Currently, there is no standardized protocol for the optimal surgical approach in the treatment of vesicovaginal fistula. In modern medicine, in addition to conservative treatment and classic open surgery, there are also new modern surgical methods that are less invasive, such as endoscopic, laparoscopic, and robot-assisted surgery.

Objectives: Determining the etiology and method of preoperative diagnosis of patients with vesicovaginal fistulas to determine a timely indication for conservative or surgical treatment of the patients. Analysis of patients with vesicovaginal fistulas, treated surgically and finding the most adequate surgical approach for treatment. Determining the postoperative complications of each surgical approach as well as the method of their resolution. Determining preventive measures to prevent the occurrence of vesicovaginal fistulas based on our current practice.

Materials and Methods: The study was conducted at the urology department of the City General Hospital "8th September" - Skopje in the period from January 2015 to the present. The study included patients of all ages with dysuria complaints, urinary incontinence, urine and feces leakage through the vaginal canal or patients already diagnosed in another institution. The patients included in the study underwent ultrasonography, cystoscopy (gold standard), MRI of the pelvis, MRI fistulography, cystography and micturition cystography. 24 patients will be included. The patients were examined in the urology office and then referred for further examinations. Patients in whom cystoscopy revealed changes consistent with vesicovaginal fistula were referred for cystography, MRI fistulography or CT urography and subsequently for preoperative analyses for treatment.

The study will use the quantitative and comparative method for data processing. The variables will be processed and presented in percentage, tabular and graphical form. Standard deviation will be used to present statistical values.

Results: The analysis will include 24 patients who were examined and treated at the City General Hospital "8th September" - Skopje. Of these, 20 patients (83%) were diagnosed with vesicovaginal fistula, while 4 patients (17%) were diagnosed with vesicorectovaginal fistula. Research data showed that vesicovaginal fistulas are most common in patients aged between 51-60 years (42%) and 61-70 years (33%). In most cases, the cause of vesicovaginal fistula is a hysterectomy (85%). Transvesical fistulectomy is the most commonly used technique for repairing vesicovaginal fistulas, in 70% of cases. 80% of patients with vesicovaginal fistulas were successfully treated.

Conclusion: Based on the study we conducted at the City General Hospital "8th September" - Skopje, we determined that the leading cause of vesicovaginal fistulas in 85% of cases is hysterectomy. Also, according to the data obtained from studies conducted in the USA, we can conclude that gynecological operations, i.e., hysterectomy, are the main cause of vesicovaginal fistulas. According to the analysis of our study group at the City General Hospital "8th September" - Skopje regarding the treatment of vesicovaginal fistulas, we determined that the transvesical approach for smaller and medium-sized fistulas and the transperitoneal approach for larger and complex fistulas provide better results compared to the currently available reference literature, where the transvaginal approach is used as the standard method for the treatment of vesicovaginal fistulas.

INTRODUCTION

A fistula is an abnormal opening between two organs or between an organ and the body surface. Most often, fistulas occur iatrogenically, but they can also occur as a result of congenital anomalies, neoplasia, inflammation and infection, obstetric injuries, radiotherapy, trauma, ischemia, etc. The classification of fistulas originating from the urinary tract is generally based on the organ of origin and the endpoint of the fistula, so we have urogynecological, urodigestive, urovascular and urocutaneous fistulas. Urogynecological (vesicovaginal, uretrovaginal, vesicouterine, ureterovaginal) and urodigestive fistulas (vesicorectal, vesicoenteric, ureteroenteric, pyeloenteral, uretrorectal) are the most common.

Vesicovaginal fistula is an abnormal fistulous canal that extends between the bladder and the vagina, allowing continuous involuntary leakage of urine into the vaginal vault. Vesicovaginal fistulas are the most common fistulas that occur in the female population. The prevalence of vesicovaginal fistula is approximately 1 in 1000 patients after hysterectomy [1]. According to the World Health Organization, each year between 50,000 and 100,000 women worldwide are affected by fistulas between organs of the genital tract, urinary tract, or rectum [2].

Currently, there is no standardized protocol for the optimal surgical approach in the treatment of vesicovaginal fistula. In modern medicine, in addition to conservative treatment and classic open surgery, there are also new modern surgical methods that are less invasive, such as endoscopic, laparoscopic, and robot-assisted surgery.

OBJECTIVES

Determining the etiology and method of preoperative diagnosis of patients with vesicovaginal fistulas to determine a timely indication for conservative or surgical treatment of the patients.

Analysis of patients with vesicovaginal fistulas, treated surgically and finding the most adequate surgical approach for treatment.

Determining the postoperative complications of each surgical approach as well as the method of their resolution.

Determining preventive measures to prevent the occurrence of vesicovaginal fistulas based on our current practice.

MATERIALS AND METHODS

The study was conducted at the urology department of the City General Hospital "8th September" - Skopje in the period from January 2015 to the present. The study included patients of all ages with dysuria complaints, urinary incontinence, urine and feces leakage through the vaginal canal or patients already diagnosed in another institution. The patients included in the study underwent ultrasonography, cystoscopy (gold standard), MRI of the pelvis, MRI fistulography, cystography and micturition cystography. 24 patients will be included. The patients were examined in the urology office and then referred for further examinations. Patients in whom cystoscopy revealed changes consistent with vesicovaginal fistula were referred for cystography, MRI fistulography or CT urography and subsequently for preoperative analyses for treatment.

The study will use the quantitative and comparative method for data processing. The variables will be processed and presented in percentage, tabular and graphical form. Standard deviation will be used to present statistical values.

RESULTS

The analysis will include 24 patients who were examined and treated at the City General Hospital "8th September" - Skopje. Of these, 20 patients (83%) were diagnosed with vesicovaginal fistula, while 4 patients (17%) were diagnosed with vesicorectovaginal fistula (Chart 1).

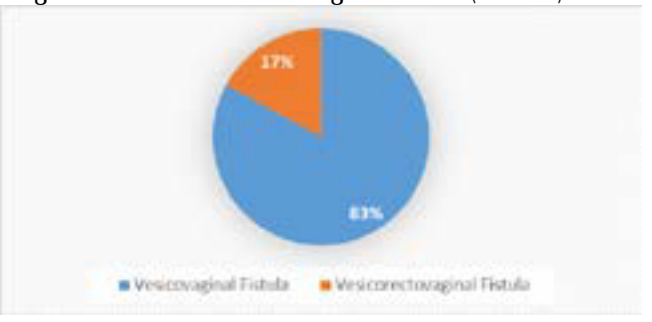

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Chart 1- Percentage of patients with vesicovaginal and vesicorectovaginal fistulas

Representation of patients with vesicovaginal fistulas depending on the age of the patients:

20-30 years: 1 patient (4%)

31-40 years: 0 patients (0%)

41-50 years: 4 patients (17%)

51-60 years: 10 patients (42%)

61-70 years: 8 patients (33%)

71-80 years: 1 patient (4%)

This data shows that most patients fall within the age groups of 51-60 years (42%) and 61-70 years (33%) (Chart 2).

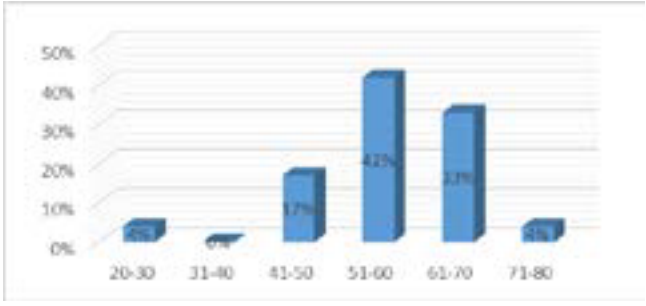

Chart 2- Percentage of patients with vesicovaginal and vesicorectovaginal fistulas by age

Representation of patients with vesicovaginal fistulas depending on the cause of their occurrence:

Post-hysterectomy: 17 patients (85%)

Post-radiation therapy: 2 patients (10%)

Post-cesarean section: 1 patient (5%)

All 4 patients with vesicorectovaginal fistulas occurred as a result of radiation for inoperable uterine cancer. (Chart 3).

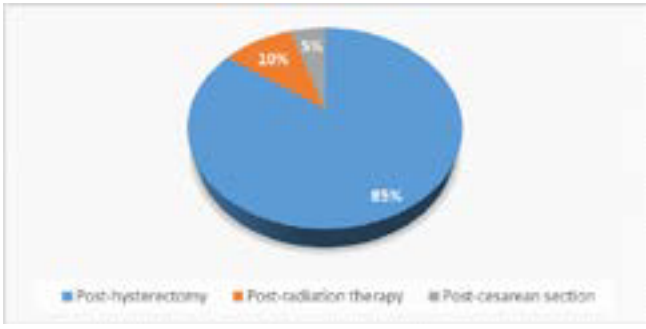

Chart 3 - Percentage of patients with vesicovaginal fistula in relation to the causes of its occurrence

Eighteen patients with vesicovaginal fistula were treated surgically, of which 14 patients (70%) with transvesical approach and 4 patients (20%) with transperitoneal approach . Two patients (10%) with vesicovaginal fistula were successfully treated with catheterization (Chart 4). All four patients with vesicorectovaginal fistulas were surgically treated and ended up with ureterocutaneostomy.

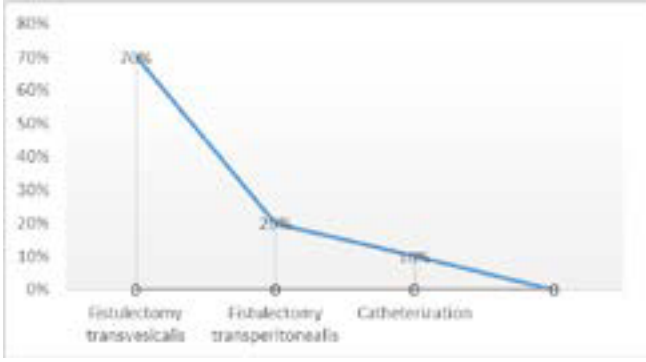

Chart 4 - Percentage of patients with vesicovaginal fistulas in relation to the method of treatment

Sixteen patients (80%) were successfully treated, while four patients (20%) with vesicovaginal fistulas resulted in relapse. However, there were no fatal cases in this group (Chart 5). Three patients with vesicorectovaginal fistulas ended with death and one patient resulted in relapse (Table 1).

	Successfully treated	Relapses	Death
Vesicovaginal fistula	16 patients (80%)	4 patients (20%)	/
Vesicorectovaginal fistula	/	1 patient	3 patients

Table 1 - The number of patients with vesicovaginal and vesicorectovaginal fistulas depending on whether they resulted in cure, relapses, or death.

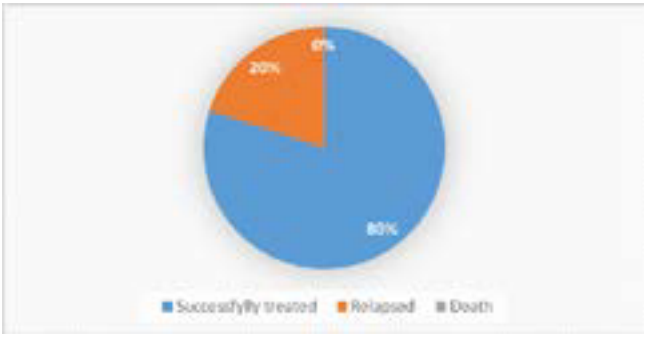

Chart 5 - Percentage of patients with vesicovaginal fistulas in relation to the outcome

DISCUSSION

Etiology of vesicovaginal fistulas

In more than 75% of cases, vesicovaginal fistulas occur during gynecological, urological, and abdominal surgeries. The causes of vesicovaginal fistulas include iatrogenic (most often during hysterectomy), radiotherapy, neoplasm, obstetric trauma, chronic urinary infections, and trauma.

In the City General Hospital "8 th Septemvri" - Skopje, 20 patients with vesicovaginal fistula and 4 patients with vesicorectovaginal fistula were examined. Vesicovaginal fistulas in 17 patients (85%) occurred after hysterectomy, in 2 patients (10%) they occurred after radiation and there is 1 patient (5%) with vesicovaginal fistula after cesarean section.

An analysis of the origin of vesicovaginal fistulas was conducted at the University of California, which included 207 operated patients over a 10-year period ending in 2001 and reported that abdominal hysterectomy as the cause of vesicovaginal fistulas occurred in 83%, vaginal hysterectomy in 8%, radiation in 4%, and other causes in 5% [4].

In 1964, the Mayo Clinic analyzed the etiology of urogynecological fistulas in 262 patients and found that uterine surgery was the cause of urogynecological fistulas in 73.7%, vaginal wall surgery in 6.5%, urinary tract surgery in 6.9%, obstetric surgery in 6.5%, and the rest from various other causes [4].

The Mayo Clinic later analyzed more than 300 fistulas and reported that gynecological surgery as the cause of urogynecological fistulas occurred in 82%, obstetric procedures in 8%, radiation in 6%, and trauma in 4% of patients [4].

Classification of vesicovaginal fistulas

There are simple and complex vesicovaginal fistulas. Simple or uncomplicated fistulas are characterized by a size ≤0.5 cm. Vesicovaginal fistulas are considered medium-sized fistulas if they measure between 0.5–2.5 cm. Complex or complicated fistulas have a size ≥2.5 cm. These types of fistulas are often associated with chronic conditions or radiation exposure. Vesicovaginal fistulas resulting from radiation, even if smaller than 2.5 cm, are classified as complex fistulas [3].

Diagnosis of vesicovaginal fistulas

The main symptoms and signs for which patients consult a urologist are:

Leakage of urine and feces through the vaginal canal

Frequent lower urinary tract infections (cystitis)

Urinary incontinence

Physical examination:

Palpation of the fistulous canal by manual examination through the vaginal canal

Speculum examination (to assess the number of fistulas, their location, and size)

Diagnostic methods:

Ultrasonography (very low specificity and sensitivity for vesicovaginal fistulas)

Cystoscopy (the gold standard for diagnosing vesicovaginal fistulas)

Cystourethrography

MRI fistulography / MRI of the pelvis

CT urographyBottom of Form

Treatment of Vesicovaginal Fistulas

The goal of treatment for vesicovaginal fistulas is to quickly stop the leakage of urine into the vagina and restore normal physiological urination and genital function. Vesicovaginal fistulas can be treated with:

a. Conservative Treatment

b. Minimally Invasive Treatment

c. Invasive Surgical Treatment (abdominal and vaginal approach)

Conservative and Minimally Invasive Treatment

For at least 2 to 3 weeks, patients with newly diagnosed

vesicovaginal fistula may result in spontaneous healing with continuous catheterization and anticholinergic drugs (Davits and Miranda, 1991). Patients with fistulas smaller than 3 mm may be treated with endoscopic electrocoagulation of the fistulous opening. Minimally invasive electrocoagulation may be combined with catheterization. The procedure with endoscopic electrocoagulation should be performed carefully because of the risk of over coagulation which can cause extensive tissue necrosis, scaling and fistula enlargement (O'Conor and Sokol, 1951) [4] [9].

Fibrin glue is used as an adjunctive measure for the treatment of vesicovaginal fistulas. It is injected transvaginally under cystoscopic guidance directly into the fistula tract. In general, these conservative measures are useful for small, oblique fistulas (usually less than 2 to 3 mm in diameter) [4] [10].

Surgical Treatment

Abdominal Approach

The abdominal surgical approach can be transperitoneal or transvesical. If vesicovaginal fistulas are associated with some other intra-abdominal pathology requiring repair, including ureteral injury (for example, ureterovaginal fistula), a complicated fistula, or even if another intra-abdominal organ is involved, then a transperitoneal approach is indicated for simultaneous problem solving. If cystoplasty is required (especially in patients after radiotherapy), a transperitoneal approach is indicated, as both procedures can be performed through one incision. Complex fistulas, including fistulas with previous failed repair attempts (Kristensen and Lose, 1994) or those that are large (> 5 cm), are an indication for a transperitoneal approach. The most used techniques for interposition of tissues with a transabdominal approach to prevent recurrence are the omentum and the peritoneum (Eisen et al, 1974) [4].

The transvesical approach is most often used for uncomplicated vesicovaginal fistulas, but it can also be used in some cases of complex fistulas. This approach can also be performed if the fistula is close to orifices. The abdominal cavity is not opened during this approach. During the intervention, the bladder can be dislocated cranially from the vagina to prevent their mutual contact, which reduces the risk of recurrence [4].

Vaginal Approach

Surgeons recommend the transvaginal approach for the treatment of smaller and simpler fistulas, especially if the patient has not had radiation therapy and if the fistula is not close to the openings. The advantages of using this approach are the operation takes less time, the patient does not have an incision, the hospital stay is shorter, their life returns to normal more quickly, they lose much less blood and feel less pain after the operation. However, some postoperative complications may occur, such as insertion of the ureters, shortening or stenosis of the vagina and the occurrence of recurrences.

If surgeons decide on a transvaginal approach, to reduce the risk of recurrence, they can perform a tissue interposition, and the fat tissue from the labia or Martius (Henrich Martius, 1928) is most often used [4].

Prevention of Vesicovaginal Fistulas

According to data obtained from the research conducted at the City General Hospital "8th of September" – Skopje and from the available reference literature, the majority of vesicovaginal fistulas occur during gynecological surgeries, i.e. hysterectomy. Therefore, precautions should be taken during the intervention to prevent iatrogenic injury and the occurrence of fistula.

These measures include: The installation of a JJ stent by a urologist to prevent ureteral injury; Improvement in technical aspects of surgical procedures; Training programs for young specialists to improve their surgical skills; Then, better lifestyle habits to avoid health problems and the need for gynecological and other types of interventions, avoiding of cesarean section, limited use of radiotherapy as a treatment option for malignant diseases. Also, an effort should be made to educate the public about the prevalence and prevention of vesicovaginal fistulas.

CONCLUSION

Based on the study we conducted at the City General Hospital "8th September" - Skopje, we determined that the leading cause of vesicovaginal fistulas in 85% of cases is hysterectomy. Also, according to the data obtained from studies conducted in the USA, we can conclude that gynecological operations, i.e. hysterectomy, are the main cause of vesico-vaginal fistulas.

According to the analysis of our study group at the City General Hospital "8th September" - Skopje regarding the treatment of vesicovaginal fistulas, we determined that the transvesical approach for smaller and medium-sized

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