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### RESEARCH ARTICLE

#### CLINICAL PROFILE OF BLADDER OUTLET OBSTRUCTION {BOO} IN FEMALE.

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#### Abstract

**Aim:-** To evaluate female patients of bladder outlet obstruction and find out common causes and clinical presentation of boo . To understand diagnostic modalities, treatment modalities and complications of boo in female. **Study Design:-** This is a prospective study of 50 female patients presented with bladder outlet obstruction in a single centre. including only female patients > 15 years age and excluding females with prior surgery of urinary tract / perineal surgery / spine surgery / known spine pathology .

**Result:-** According to age: the maximum number of cases (22%) is seen in the age group of 56 years to 65 years , body mass index(bmi) majority (52%) of the patients were in the bmi group of 26 - 29 kg/m<sup>2</sup>. Symptoms in female boo majority (96%, n: 48) had sensation of incomplete emptying at the end of micturation. etiology most common causative pathology was urinary tract infection 28% (n: 14) surgical treatment offered 30% (n: 15) and received urethral dilatation/ urethrotomy.

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#### Introduction:-

Bladder outlet obstruction (BOO) in females, a relatively uncommon condition has recently attracted more attention and has got better identified. The International Continence Society has defined BOO as a 'generic term for obstruction during voiding and is characterized by increased detrusor pressure and reduced urine flow rate.<sup>1,2</sup>

The International Continence Society (ICS) states that: 'Normal voiding is achieved by a voluntarily initiated continuous detrusor contraction that leads to complete bladder emptying within a normal time span and in the absence of obstruction<sup>3</sup>.

The prevalence of Bladder outlet obstruction is unknown. Though, large retrospective review trials have estimated that, of the 19.4% ~25.5% women who present with lower urinary tract symptoms, 6.5% ~9.6% were classified as Female BOO. BOO may be induced by specific functional and anatomic causes, the resulting obstruction produces lower urinary tract symptoms (LUTS). Categorizing and understanding these symptoms and causes is crucial when proceeding with evaluation for specific diagnostic modalities to be used to fully delineate the degree of BOO.

The dynamics of voiding in females is more complex than in the males, presumably due to mobility of the bladder neck and proximal urethra as well as due to the action of pelvic floor movements and fasciae over the urethra. In addition, anatomic differences allow many women to empty their bladders by simply relaxing the pelvic floor, some augment voiding by abdominal straining.

Due to the diverse characteristics of Female Bladder Outlet Obstruction and the lack of Gold Standard in diagnosis the management of bladder outlet obstruction in females is perhaps as complex as its diagnosis.<sup>1</sup> However determining outlet obstruction in females still remains an intriguing proposition, requiring clinical studies and research<sup>4</sup>. Once the cause is determined, appropriate treatment will lead to resolution of symptoms in most patients.<sup>5,2</sup>

### **Material and Method:-**

This is a prospective study of 50 female patients presented with Bladder Outlet Obstruction. The study was conducted at Padmashree Dr. D.Y.Patil Hospital and Research Institute, Kolhapur from May 2012 to April 2015 at the Department of General Surgery.

### **Inclusion Criteria:-**

Female Patients > 15 years age

### **Exclusion Criteria:-**

Females with prior surgery of urinary tract / perineal surgery / spine surgery / known spine pathology.

### **Methods:-**

All the patients were evaluated as per the proforma. Special attention to the voiding symptoms, associated gynaecological disorder, history of previous catheterization and operation were noted.

- Female patients presenting with lower urinary tract symptoms (LUTS) like increased frequency, urgency, nocturia, poor stream, hesitancy, straining, and incomplete voiding were screened..
- All relevant investigations (Routine hematological tests, urine for routine and cytology, culture and sensitivity, Renal Function Tests, Ultrasonography of abdomen and pelvis, Uroflowmetry and Cystoscopy) were done in these cases to establish the diagnosis.
- Maximum Flow rate (Qmax) of >15ml/second and voided volume of 150 ml is considered normal. Patients with Qmax<15 ml/second were suspected as a case of BOO.
- Depending on the findings and diagnosis, cases were considered for treatment accordingly.
- The proposed procedure was explained to the patient and relatives and a written consent was obtained prior to surgery. After appropriate anaesthesia Cystoscopy was carried out in the operation theatre. A rigid cystoscope (17 French) / Ureteroscope with fiberoptic light source and video camera fitted to it gently passed. Pan endoscopic examination was done from the meatus, urethra, bladder neck and the interior of urinary bladder. Appropriate procedures like Urethral dilatation, Otis urethrotomy, visual internal urethrotomy in stricture urethra, cauterization of pseudomembrane, bladder neck incision was done. Foley catheterization (No. 16 French) was done.
- Patients with no demonstrable cause and suspected to have neurogenic/ dysfunctional voiding were either subjected to Uro-Dynamic Studies or were prescribed medical management.
- Patients were advised regular follow up.
- A wide variation in prevalence from 2.7-46.4% is reported depending on the methodology adopted. This underlines the need for more reviews and research in this area.

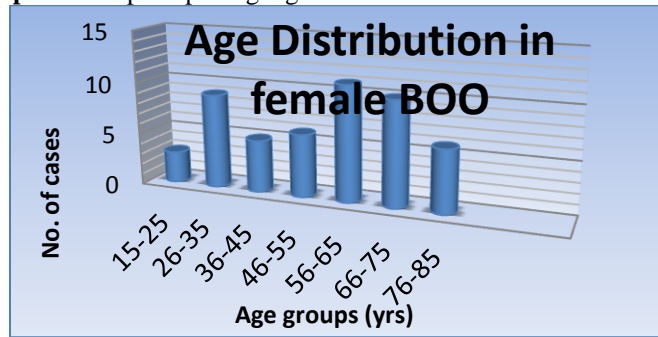
### **Observations and Results:-**

During this study a total of 50 female cases with Bladder Outlet Obstruction were studied. The following are the observations:

### **Age Distribution:-**

The mean age of the patient in our study is 53.9 years (15years -85years). The maximum number of cases (22%) is seen in the age group of 56 years to 65 years.

**Graph 1:-** Graph depicting Age Distribution in Female BOO.



**Body Mass Index(Bmi):-**

Majority (52%) of the patients were in the BMI group of 26 - 29 kg/m<sup>2</sup>.The mean BMI was 25.2 Kg/m<sup>2</sup>.

**Lower Urinary Tract Symptoms in female BOO:-**

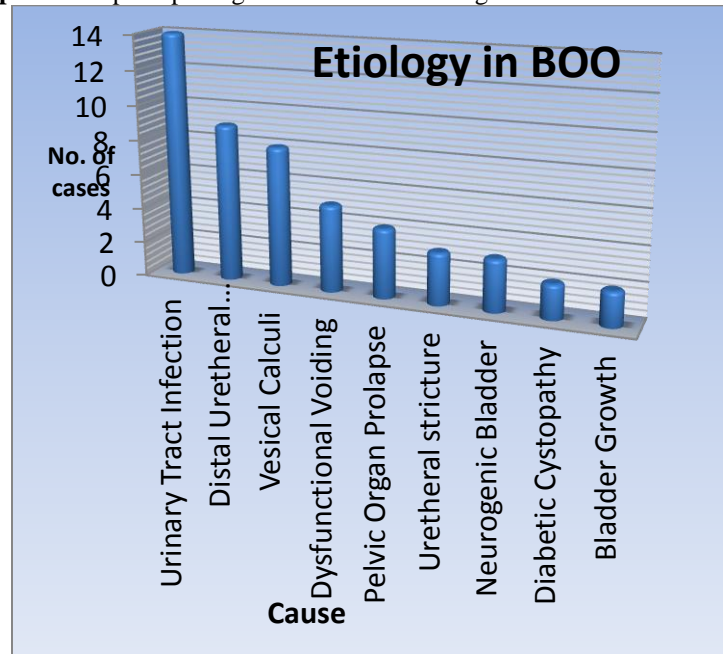
Considering all the voiding urinary complaints, majority of the patients (96%, n: 48) had sensation of incomplete emptying at the end of micturition. Most of them had poor stream (92%, n: 46) or straining for micturition (66%, n: 33). Similarly, common symptom was day time or night time frequency (92%, n:46)

**Table 1:-** Distribution of Lower Urinary Tract Symptoms in female BOO.

Symptoms	No. of cases	Percentage %
Urgency	15	30
Nocturia	42	84
Frequency	46	92
Straining	33	66
Incomplete emptying	48	96
Poor stream	46	92
Hesitancy	24	48

**Etiology in female Bladder Outlet Obstruction:-**

The most common causative pathology was Urinary Tract Infection28% (n: 14), followed by Distal Urethral Stenosis in 18% (n: 9), Vesical Calculi in 16% (n: 8), Dysfunctional voiding in 10% (n: 5)of cases. Rest formed 28% (n: 14) of the cases.

**Graph 2:-** Graph depicting distribution of Etiological Factors in Female BOO.**Organisms Isolated on Urine Culture in female Bladder Outlet Obstruction:-**

In our study, 41 (82%) patients out of 50 had Urinary Tract Infection. On urinary culture the most common organism found was E.coli in 82.9% (n: 34), followed by mixed cultures in 4 patients 9.7% (n: 4). Proteus, Klebsiella and Pseudomonas were found in one case each (2.4%).

**Distribution of Maximum Flow Rate 'Qmax' at Uroflowmetry:-**

The maximum urine flow rate (Qmax) at Uroflowmetry in our cases was less than 12mL/sec in 92% of the cases. 4 patients (8%) had a Qmax in the range of 13-15mL/sec.

Maximum Flow Rate (Qmax) mL/sec	No. of cases	Percentage %
4-8	12	24
9-12	34	68
13-15	4	8

**Table 8:-** Distribution of Maximum Flow Rate 'Qmax' at Uroflowmetry.**Uro-dynamic study:-**

In this study, urodynamic study was performed in 20% (n: 10) cases. The flow rate is <15 ml/sec. The detrusor pressures in underactive bladder are <16 cm H<sub>2</sub>O.

In neurogenic bladder there is poor bladder compliance with large bladder capacity. In cases of diabetic cystopathy there is poor bladder compliance with large bladder capacity. While in dysfunctional voiding there is varied bladder compliance and bladder capacity. In the cases of dysfunctional the detrusor pressures are >35 cm H<sub>2</sub>O.

**Blood Urea Levels:-**

In our study 96% of the cases had Blood Urea levels in normal range. While 4% (n: 2) had deranged Blood Urea levels.

**Serum Creatinine Levels:-**

96% of the cases in our study had Serum Creatinine levels in normal range. 4% (n: 2) had deranged levels Serum Creatinine levels.

**Co- morbidities:-**

In our study 20% (n: 10) cases of 50 had Diabetes Mellitus, 28% (n: 14) cases had Hypertension. 12% (n: 6) had both Diabetes Mellitus and Hypertension.

**Treatment:-****Treatment modality offered:-**

In our study, 52% (n: 26) of the cases were treated surgically, 28% (n: 14) cases given medical line of management, and 20% (n: 10) cases required combined (medical and surgical) modality of treatment.

**Table 3:-** Distribution of treatment modalities offered in female BOO.

Type	No. of cases	Percentage %
Surgical	26	52
Medical	14	28
Combined	10	20
Total	50	100

**Surgical Treatment offered:-**

In our study, 30% (n: 15) cases received urethral dilatation/ urethrotomy, 16% (n: 8) required Cystolithotripsy, 4% (n: 2) required Trans-Urethral Resection of Bladder Tumour (TURBT), and in 8% (n: 4) Pelvic Organ Prolapse (POP) repair was done.

**Table 4:-** Distribution of surgical treatment modality offered in female BOO.

Treatment modality	No. of cases	Percentage %
Urethral dilatation/ Urethrotomy	15	30
Cystolithotripsy	8	16
TURBT	2	4
POP repair	4	8

**Discussion:-**

The study on clinical profile of Bladder Outlet Obstruction in females (BOO) when compared to the previous studies carried out throughout the world, in most of the aspects there was a wide range of difference.

**Age Distribution in Female Bladder Outlet Obstruction:-**

In our study of BOO in females, mean age of the patients is 53.9 which is similar to some but different from many other studies.

- Our study shows that Bladder Outlet Obstruction is common in the post-menopausal women. The reason being changes in the hormonal status and age related anatomical derangements. Nadir et al.<sup>6</sup> in his case study of 221 patients has found, the mean age group associated with BOO was 51.8 years (range: 22–91), which correlates to our study.
- Oravanet al.<sup>7</sup> in his study shows that, mean age of the study population was  $53.7 \pm 13.6$  years. Nitti et al.<sup>8</sup> showed in their study of 76 obstructed cases the mean age was 57.5 years. Metinet al.<sup>9</sup> in his study found the mean age is 52.6 years.

**Incidence of Bladder Outlet Obstruction in Females:-**

The incidence of BOO in our study is 6.5%. 72 cases were found to be obstructed and labeled BOO on the basis of uroflowmetry and significant post-void residual urine. Which also is closely in the range of various previous studies. Groutz et al.<sup>10</sup> conducted a large retrospective review of women with lower urinary tract symptoms (LUTS), and recognized BOO in 6.5% of the cases<sup>5</sup> which is similar to our study.

**Lower Urinary Tract Symptoms (LUTS) in BOO.**

- In our study of **Lower Urinary Tract Symptoms**, more than 84% cases presented with nocturia, frequency, straining, incomplete emptying, poor stream
- **Urinary tract infection (UTI)** is the most common etiology observed in our study. 78% Urinary tract infection was the sole cause attributed to BOO.

- **Distal Urethral Stenosis (DUS)** is the 2<sup>nd</sup> most common etiology found in our study affecting 18%(n: 9) of cases.
- **Urethral Stricture** was the cause in 6% (n: 3) of the cases.They underwent Urethral Dilatation to 30 Fr. with Otis urethrotomy.
- There were 6% cases (n: 3) of **Neurogenic bladder** and **Pelvic Organ Prolapse(POP)**.

#### **Organisms at Urine Culture in cases of BOO:-**

E. coli was predominantly found in 82.9 % (n: 34) of the cases.

#### **Uroflowmetry in evaluation of female BOO.**

- In our study the mean Qmax was 9.6 mL/sec (4-14mL/sec). 92% of cases in our study had Qmax <12 mL/sec. Therefore our study includes severely obstructed group. Axelrod et al.<sup>11</sup> identified bladder-neck obstruction in a group of women, using and Qmax of <12 ml/s as cutoff. Yong et al.<sup>12</sup> have defined female Bladder Outlet Obstruction as Qmax <15 mL/sec. on Uroflowmetry.

#### **Uro-Dynamic Studies in female BOO:-**

In cases where identifiable anatomical cause for BOO was not found, Uro-Dynamic Study (UDS) was performed. The studies showed: maximum flow rate (Qmax) <12 ml/s, detrusor pressure at maximum flow (pdet.Qmax) of >20 cm H<sub>2</sub>O in dysfunctional voiding cases

#### **Co-morbidities associated with female BOO:-**

- ❖ Of the 50 cases 20 % (n: 10) of the total cases were diagnosed cases of diabetes mellitus and 28% (n: 14) of the cases were a known case of hypertension. 4 % (n: 2) of the diabetics were diagnosed with changes of Diabetic Cystopathy.

#### **Post Void Residue Study:-**

All the cases of Bladder Outlet Obstruction in females underwent Pre-void and immediate Post-void residual urine study by abdominal Ultrasonography. 54% of the cases (n: 27) had a Post Void urine residue of >100ml. The mean PVR in our study is 161.5mL.

- Patients with functional BOO had a mean PVR urine of 243mL, while those with anatomical BOO had a mean PVR urine of 141.1mL. It is observed that, the patients with Dysfunctional Voiding (DV) had post void residue of more than 210ml. The mean Post void residue of DV cases was 298.2 mL of urine in our study of Bladder Outlet Obstruction in females. Haylen et al.<sup>13</sup> have concluded that postvoid residual volumes higher than 30mL are significantly associated with increasing age, higher grades of prolapse, and increased prevalence of recurrent Urinary Tract Infection, this is evident in our study.
- Nittiet al.<sup>8</sup> found a mean post-void residual urine (157 versus 33 ml, p <0.0001) in their study which correlates the value in our study.

#### **Treatment Of Female Bladder Outlet Obstruction:-**

To summarize, the treatment was mainly surgical, medical and in some cases combined approach was utilized. 52% (n: 26) cases were treated surgically, 28% (n: 14) cases received medical line of management while 20% (n: 10) cases required combined modality of treatment approach.

In our study, surgical treatment included urethral dilatation/ urethrotomy in 30% (n: 15) cases, cystolithotripsy in 16% (n: 8) cases, Trans-Urethral Resection of Bladder Tumour (TURBT) in 4% (n: 2) cases, and in 8% (n: 4) cases of Pelvic Organ Prolapse (POP), POP repair was done.

Thorough evaluation of the cases enables identification of the cause of BOO and to determine the treatment plan. The most important part of its identification is a high index of suspicion. Once the cause is determined, appropriate treatment will resolve the symptoms in most of the patients.

**Bibliography:-**

1. ShirishYande, Maya Joshi; Bladder outlet obstruction in Women;Journal of Mid-life Health, Year 2011, Volume 2, Issue 1: pages 11-17;
2. J G Zhang;Research On The Diagnosis Of Female Bladder Outlet Obstruction; Urology 2007-05-26.
3. Abrams P, Anderson KE, Birder L, Brubaker L, Cardozo L, Chapple C, et al.; Fourth international consultation on incontinence recommendations of the international scientific committee: evaluation and treatment of urinary incontinence, pelvic organ prolapse, and fecal incontinence; NeurourolUrodyn 2010;29:213–40.
4. Bennet Jones , M. J; treatment of Cystitis in Females; Lancet, I (1962), 299-302
5. Roger R Dmochowski; Bladder Outlet Obstruction Etiology and Evaluation; Review In Urology 2005; 7 (Suppl 6): pages S3–S13.
6. Nadir I. Osman, AltafMangera, Christopher R. Chapple; A Systematic Review of Surgical Techniques Used in the Treatment of Female Urethral Stricture; European Urology 6 4 (2 0 1 3) 9 6 5 – 9 7 3.
7. OrawanLekskulchaiand Hans Peter Dietz; Is detrusor hypertrophy in women associated with voiding dysfunction?; Australian and New Zealand Journal of Obstetrics and Gynaecology 2009; 49: 653–656
8. Nitti VW, Tu LM, Gitlin J; diagnoses bladder outlet obstruction in women.J Urol. 1999 May; 161(5):1535-40.
9. A Metin, O. Kayigil , S. I. Ahmed; The rate of urgency symptoms in women with stress urinary incontinence and nomogram based bladder outlet obstruction; International Urology and Nephrology; 2000; 32, 2; 251
10. Groutz A, Blaivas JG, Chaikin DC. Bladder outlet obstruction in women: Definition and characteristics. NeurourolUrodyn 2000;19:213-20.
11. Axelrod SL, Blaivas JG. Bladder neck obstruction in women. J Urol. 1987;137:497–499.
12. BartoszDybowski, EwaBres-Niewada, PiotrRadziszewski; Pressure-flow nomogram for women with lower urinary tract symptoms; Arch Med Sci. Aug 29, 2014; 10(4): 752–756. 2014.
13. Haylen BT, Lee J, Logan V, Husselbee S, Zhou J, Law M; Immediate postvoid residual volumes in women with symptoms of pelvic floor dysfunction.; Obstet Gynecol. 2008 Jun;111(6):1305-12