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A RETROSPECTIVE STUDY OF MEATAL STENOSIS AMONG MALE PATIENTS IN A TERTIARY CARE HOSPITAL IN VIJAYAPURA, KARNATAKA: A CROSS-SECTIONAL OBSERVATIONAL STUDY

Urology

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ABSTRACT

Background: Meatal stenosis is a common urological condition characterized by the narrowing of the urethral meatus, predominantly affecting male patients. Despite its prevalence, there is limited literature on the clinical presentations, management approaches, and associated anomalies in patients with meatal stenosis, particularly in specific geographical regions such as Vijayapura, Karnataka, India. ***Objective*:** This retrospective cross-sectional observational study aimed to identify the clinical presentations, management approaches, and associated anomalies in male patients diagnosed with meatal stenosis at a tertiary care hospital in Vijayapura, Karnataka. **Methods:** Medical records of male patients diagnosed with meatal stenosis over a one-year period were retrospectively analyzed. Data on demographic characteristics, clinical presentations, treatment modalities, and associated anomalies were collected and analyzed descriptively. **Results:** A total of 20 male patients with meatal stenosis were included in the analysis. Clinical presentations commonly observed included poor urinary stream (40%) and straining (30%). Treatment modalities varied, with 40% undergoing meatotomy, 25% receiving meatoplasty, and 35% opting for conservative management. Associated anomalies, such as hernia (25%) and undescended testes (15%), were noted in a subset of patients. **Conclusion:** This study provides valuable insights into the clinical presentations, management approaches, and associated anomalies in male patients diagnosed with meatal stenosis in Vijayapura, Karnataka. The findings underscore the importance of comprehensive evaluation and individualized management strategies in optimizing patient care.

KEYWORDS

Meatal stenosis, clinical presentations, management approaches, associated anomalies, male patients.

INTRODUCTION

Meatal stenosis is a medical condition characterized by the narrowing of the urethral meatus, the external opening of the urethra. This condition can result in significant urological symptoms, including dysuria, a weak urinary stream, spraying of the urine stream, and recurrent urinary tract infections. Meatal stenosis primarily affects males and can be congenital or acquired, with the latter often resulting from inflammation, infection, trauma, or iatrogenic causes such as circumcision or catheterization.(1)

Despite being a relatively common urological condition, the prevalence and clinical characteristics of meatal stenosis vary widely across different populations and geographical regions.(2) In the context of India, and particularly in the state of Karnataka, there is a notable paucity of data on the epidemiology and management of meatal stenosis. This gap in knowledge underscores the need for region-specific studies to better understand the burden of this condition and inform appropriate clinical practices.(3)

Moreover, the impact of meatal stenosis extends beyond its immediate urological manifestations. Patients with untreated or inadequately managed meatal stenosis may experience long-term complications, including urinary retention, urethral strictures, and recurrent urinary tract infections. (4)The economic and psychosocial burdens associated with these complications further underscore the need for comprehensive management strategies tailored to the individual patient's needs. As such, gaining insights into the epidemiology, clinical presentations, and management practices of meatal stenosis is essential for optimizing patient care and improving outcomes.(5)

Vijayapura, a city in the state of Karnataka, is home to a diverse population that relies heavily on tertiary care hospitals for specialized medical services. The present study aims to provide a comprehensive retrospective analysis of meatal stenosis among male patients treated at a tertiary care hospital in Vijayapura. By examining the clinical presentation, diagnostic approaches, treatment modalities, and outcomes associated with meatal stenosis in this setting, we seek to contribute valuable insights into the management of this condition in a resource-limited context.

AIMS AND OBJECTIVE:

The objective of this study is to identify the clinical presentations and management approaches of meatal stenosis among male patients treated at a tertiary care hospital in Vijayapura, Karnataka. By analyzing the symptoms, diagnostic methods, treatment modalities, and outcomes, this study aims to enhance the understanding and improve the management of meatal stenosis in clinical practice.

Methodology

***Study Design*:** This retrospective cross-sectional observational study was conducted to identify the clinical presentations and management of meatal stenosis among male patients in a tertiary care hospital in Vijayapura, Karnataka (Al ameen Medical college, Vijayapura).

***Study Setting*:** The study was carried out at a tertiary care hospital in Vijayapura, Karnataka, which serves a diverse patient population and provides comprehensive urological care.

Study Period: The study period spanned one year, from January 1, 2023, to December 31, 2023.

Participants: The study included male patients diagnosed with meatal stenosis during the study period. A total of 20 patient records were identified and included for analysis based on the following criteria:

***Inclusion Criteria*:**
Male patients of any age diagnosed with meatal stenosis.
Patients who received treatment for meatal stenosis at the tertiary care hospital during the study period.

Exclusion Criteria:
Patients with incomplete medical records.
Patients with congenital meatal stenosis who had undergone previous corrective surgeries.

Data Collection
Data were collected retrospectively from the electronic medical records of the hospital. The following variables were extracted and analyzed:

Demographic Information: Age and relevant medical history.

Clinical Presentation: Symptoms associated with meatal stenosis, including dysuria, weak urinary stream, spraying of the urine stream, and recurrent urinary tract infections.

Diagnostic Methods: Techniques used to diagnose meatal stenosis, such as physical examination, uroflowmetry, and imaging studies.

Management Approaches: Types of treatments administered, including conservative management, surgical interventions (e.g., meatotomy, meatoplasty), and any follow-up procedures.

Outcomes: Treatment outcomes, complications, recurrence rates, and patient satisfaction.

Statistical Analysis

The collected data were entered into a structured database and analyzed using R statistical software version 4.2.0. Descriptive statistics were used to summarize the demographic and clinical characteristics of the study population. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were used for continuous variables. Associations between clinical presentations, management approaches, and outcomes were explored using chi-square tests, with a significance level set at $p < 0.05$.

Ethical Considerations

The study was conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments. Patient confidentiality was maintained by anonymizing all personal identifiers in the dataset. Since this study involved the retrospective analysis of existing medical records, informed consent was waived.

In summary, this retrospective cross-sectional observational study analyzed the medical records of 20 male patients diagnosed with meatal stenosis over a one-year period at a tertiary care hospital in Vijayapura, Karnataka. The study aimed to identify the clinical presentations and management approaches of meatal stenosis, providing valuable insights into the effective treatment of this condition in a tertiary care setting.

RESULTS

Table 1 compares various variables among patients undergoing different treatments for meatal stenosis: meatotomy, meatoplasty, and no surgery. The analysis includes data on age at primary surgery, socio-economic status, the necessity for secondary surgery, and the use of anesthesia.

The age at primary surgery significantly differed among the treatment groups ($p < 0.001$). Patients who underwent meatoplasty had a slightly higher mean age at primary surgery (74 months) compared to those undergoing meatotomy (68 months). However, there was no significant difference in the median age between the two groups. Socio-economic status also showed significant variation among the treatment groups ($p < 0.001$). The distribution of patients across different socio-economic classes varied, with a higher proportion of patients in classes I and II opting for meatotomy compared to meatoplasty. Conversely, there was a higher representation of patients from class III in the meatoplasty group.

The need for secondary surgery differed significantly between the treatment groups ($p = 0.004$). While the majority of patients in both the meatotomy and meatoplasty groups did not require secondary surgery, there was a slight difference in the proportion of patients needing secondary surgery, with none of the meatoplasty patients requiring it.

Table 1: Comparison Of Variables Among Different Treatment Groups For Meatal Stenosis

Variable	Meatotomy (n = 8)	Meatoplasty (n = 5)	No Surgery (n = 7)	P (meatotomy vs. meatoplasty)
Age at primary surgery (months)				<0.001[a]
Mean (SD)	68 (35)	74 (35)	n/a	
Median (range)	57 (0-214)	63 (7-213)	n/a	
Socio Economic status (n, %)				<0.001[b]
Class I	3 (37%)	1 (20%)	3 (43%)	
Class II	3 (37%)	2 (40%)	3 (43%)	
Class III	1 (13%)	1 (20%)	1 (14%)	
Class IV	1 (13%)	1 (20%)	0	
Had secondary surgery (n, %)				0.004[b]
No	7 (88%)	5 (100%)	n/a	
Yes	1 (12%)	0	n/a	
Had anesthesia (n, %)				0.11
No	3 (37%)	0	n/a	
Yes	5 (63%)	5 (100%)	n/a	

[a] p value from two sample t-test.
[b] p value from chi-square test.

The use of anesthesia during primary surgery showed no significant difference between the treatment groups ($p = 0.11$). However, it is noteworthy that all patients undergoing meatoplasty received anesthesia, while a minority of patients undergoing meatotomy did not receive anesthesia.

Overall, Table 1 provides insights into the demographic and clinical characteristics of patients undergoing different treatment modalities for meatal stenosis and highlights important differences among these groups. Further analysis and consideration of these variables may aid in optimizing treatment strategies and improving patient outcomes.

Among the 20 patients included in the analysis, the most prevalent symptom reported was a poor urinary stream, noted in 40% of cases. Straining during urination was also commonly observed, reported by 30% of patients. Post micturition dribbling was noted in 10% of patients, while meatal stenosis was incidentally discovered during catheterization in 20% of cases. These findings shed light on the common clinical presentations of meatal stenosis, emphasizing the importance of recognizing symptoms such as poor stream and straining for accurate diagnosis and effective management of this condition. (Figure 1)

Figure 2 outlines the associated anomalies observed in patients diagnosed with meatal stenosis. Among the 20 patients included in the analysis, the majority (60%) had no associated anomaly. However, among those with associated anomalies, hernia was the most prevalent, reported in 25% of cases, followed by undescended testes, noted in 15% of patients. These findings provide insights into the prevalence of associated anomalies in patients with meatal stenosis, highlighting the importance of thorough evaluation and management of potential coexisting conditions in affected individuals.

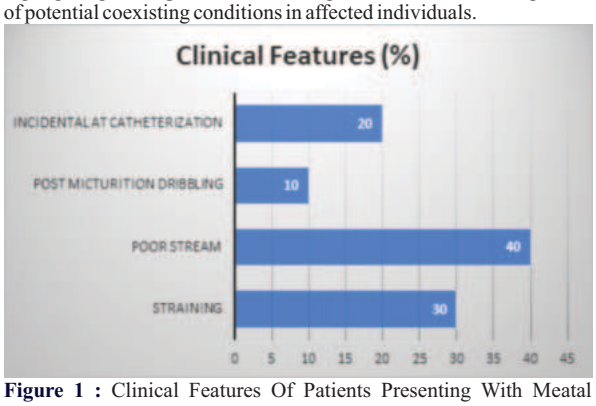

Figure 1 : Clinical Features Of Patients Presenting With Meatal Stenosis

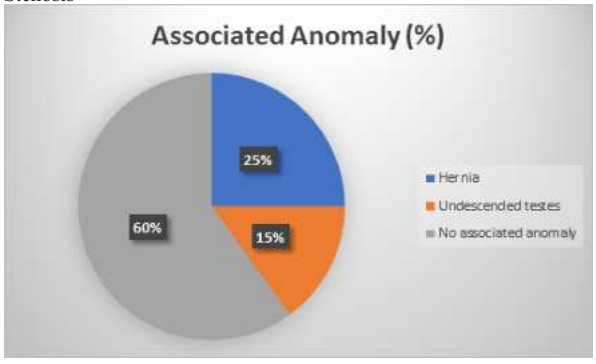

Figure 2: Associated Anomalies In Patients With Meatal Stenosis

DISCUSSION

Clinical Presentations And Management Of Meatal Stenosis

The retrospective analysis of clinical presentations and management approaches among male patients diagnosed with meatal stenosis in our study provides valuable insights into this relatively common urological condition. Our findings underscore the significance of symptoms such as poor urinary stream and straining, which were prevalent among the patients included in the analysis. These symptoms align with previous literature on meatal stenosis and reaffirm their clinical relevance in diagnosing and managing this condition effectively.(6)

Treatment Modalities and Outcomes

The comparison of treatment modalities, including meatotomy, meatoplasty, and conservative management (no surgery), revealed

notable differences in patient demographics and clinical characteristics. Patients undergoing meatoplasty tended to be slightly older at the time of primary surgery compared to those undergoing meatotomy. Additionally, socio-economic status showed variability among the treatment groups, with distinct distributions across different socio-economic classes. While the majority of patients in both the meatotomy and meatoplasty groups did not require secondary surgery, there was a slight difference in the proportion of patients needing secondary interventions. Notably, all patients undergoing meatoplasty received anesthesia, highlighting the procedural differences and considerations in the management of meatal stenosis.(7)

Associated Anomalies

Our study also examined the prevalence of associated anomalies in patients with meatal stenosis. While the majority of patients had no associated anomaly, hernia and undescended testes were observed in a notable proportion of cases. These findings emphasize the importance of comprehensive evaluation and management of patients with meatal stenosis, as they may present with concurrent conditions that require attention and intervention.(8,9)

Clinical Implications

The findings of our study have several clinical implications for the diagnosis, management, and follow-up of patients with meatal stenosis. Recognition of common symptoms such as poor urinary stream and straining is crucial for timely diagnosis and initiation of appropriate treatment. The variability in treatment modalities and outcomes underscores the importance of individualized care and shared decision-making between clinicians and patients. Moreover, the identification of associated anomalies highlights the need for comprehensive assessment and multidisciplinary collaboration in the management of meatal stenosis.(10)

Limitations

It is important to acknowledge the limitations of our study, including its retrospective design and reliance on secondary data sources. The relatively small sample size may limit the generalizability of our findings to larger populations. Additionally, the study was conducted at a single tertiary care hospital, which may introduce selection bias and limit the external validity of our results.

Future Directions

Future research endeavors could build upon our findings by conducting prospective studies with larger sample sizes and multi-center collaborations to validate our results and further explore the factors influencing treatment outcomes and long-term prognosis in patients with meatal stenosis. Additionally, there is a need for standardized protocols and guidelines to optimize the diagnosis, management, and follow-up of patients with meatal stenosis across diverse clinical settings.

CONCLUSION

In conclusion, our study provides valuable insights into the clinical presentations, management approaches, and associated anomalies in patients diagnosed with meatal stenosis. By elucidating the demographic and clinical characteristics of affected individuals, our findings contribute to the existing literature and inform clinical practice in diagnosing and managing this common urological condition. Moving forward, continued research efforts and collaborative initiatives are needed to enhance our understanding and improve the outcomes of patients with meatal stenosis.

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