

# Is testicular microlithiasis associated with testicular pathologies in children?

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## Research Article

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# Abstract

**Purpose:** To analyze the association of testicular pathologies with TM.

**Method:** The retrospective study included pediatric patients who underwent scrotal ultrasonography (US) due to complaints including testicular pain, discomfort, swelling, scrotal redness in our clinic between June 2020 and January 2022. The patients were divided into two groups. Group 1; patients were diagnosed with testicular pathology or presented with testicular pain. Group 2; patients without testicular pathology or complaints. Patients were also classified as having undescended testis, epididymo-orchitis, varicocele and testicular pain without testicular pathology in group 1. Group 1 and subgroups of group 1 were compared with group 2 for the presence of TM.

**Results:** A total of 516 patients were included in the study. Median age at the time of US examination was 24 months (range, 1 month - 17 years). There was no significant difference between groups 1 and 2, and boys with undescended testis and group 2 with regard to the presence of TM ( $p=0.85$ ,  $p=0.55$ , respectively). TM was significantly higher in patients who had undergone orchiopexy and presented with testicular pain compared to group 2 ( $p=0.000$ ,  $p=0.03$ , respectively). TM was not detected in patients with epididymo-orchitis, varicocele.

**Conclusion:** We found no association between TM and testicular pathologies. Orchiopexy is likely to increase the prevalence of TM. Testicular pain may be a symptom of microlithiasis.

## Introduction

Testicular microlithiasis (TM) is a clinical condition characterized by diffuse calcification within seminiferous tubules [1, 2]. Several studies have reported that undescended testis is associated with a higher prevalence of TM [1, 3, 4]. In contrast, an adult study found that testicular pathologies were not associated with TM [5].

Pediatric studies investigating TM are limited [2, 6, 7]. Clinical significance of TM and its relationship with testicular pathologies in children is still a matter of debate [1, 8, 9]. Besides, the question is "Is incidence of TM higher in these patient groups, or is it because they undergo more frequent imaging studies?"

In the present study, we aimed to analyze the association of testicular pathologies with TM.

## Patients And Methods

The retrospective study included pediatric patients who underwent scrotal ultrasonography (US) due to complaints including testicular pain, discomfort, swelling, scrotal redness in our pediatric surgery outpatient clinic between June 2020 and January 2022. All patients were examined by senior pediatric surgeon and then were referred to US examination. The patients were divided into two groups. Group 1; patients were diagnosed with testicular pathology or presented with testicular pain. Patients were also

classified as having undescended testis, epididymo-orchitis, varicocele and testicular pain without testicular pathology in group 1. Group 2 consisted of patients who presented with scrotal edema, inguinal hernia and scrotal redness without testicular pathology. Lastly, group 1 and subgroups of group 1 were compared with group 2.

Patients with testicular torsion, hydrocele, scrotal trauma, chromosomal abnormalities, a history of testicular tumor or malignancy and underwent testicular biopsy were excluded from the study.

All patients underwent US using high-frequency (12–17 MHz) linear transducers, and multiple longitudinal and transverse gray-scale images of the testes were evaluated. TM was classified as classic (five or more microliths per field of view) or limited (fewer than five microliths per field of view) [10].

An approval was obtained from the local review board (No: 2022/014).

## Statistical Analysis

Data were analyzed using SPSS for Windows version 18.0 (Chicago, IL, USA). Descriptive statistics were expressed as frequencies (n) and percentages (%) for categorical variables and as mean  $\pm$  standard deviation (SD) and median (minimum-maximum) for continuous variables. Categorical variables were compared using Chi-square test or Fishers exact test. A  $p$  value of  $< 0.05$  was considered significant.

## Results

A total of 516 patients were included in the study. Median age at the time of US examination was 24 months (range, 1 month – 17 years).

There were 373 patients in group 1 and 143 patients in group 2. TM was detected in 17 patients in group 1 and six patients in group 2. TM rates were 4.4% in all patients, 4.5% in group 1 and 4.2% in group 2. There was no significant difference between groups 1 and 2 with regard to the presence of TM ( $p = 0.85$ ).

Of the 250 (48.4%) boys diagnosed with undescended testes, seven of them were detected with TM. No significant difference was found compared with group 2 ( $p = 0.55$ ).

Ten patients had undergone orchiopexy (standard orchiopexy) prior to US examination, and three of them had TM. TM was only present in the operated testis. TM was significantly higher in patients who had undergone orchiopexy compared to group 2 ( $p = 0.000$ ).

Fifty-eight patients (11.2%) presented with scrotal pain and were found to have no testicular pathology. Among these, seven patients had TM and, TM was significantly higher within this group of 58 patients compared to group 2 ( $p = 0.03$ ).

Thirty-three patients with epididymo-orchitis and 22 varicocele were included in the study. TM was not detected in patients with epididymo-orchitis, varicocele.

Diagnosis-complaint and testicular microlithiasis status of patients were shown in Table 1.

Table 1  
Diagnosis-complaint and testicular microlithiasis status  
of patients

	<b>Patients with TM n = 23, (%)</b>
TM status, n, (%)	
Unilateral	15 (65.2)
Bilateral	8 (34.8)
TM type, n, (%)	
Classic	11 (47.8)
Limited	12 (52.1)
Diagnosis-complaint n, (%)	
Undescended testis	7 (30.4)
Pain without testicular pathology	7 (30.4)
Orchiopexied testis	3 (13)
Scrotal edema	3 (13)
Inguinal hernia	2 (8.6)
Scrotal redness	1 (4.3)

## Discussion

Prevalence of TM in the pediatric and adult male population ranges from 1.1–5.6% [11]. Goede et al. found that the prevalence of TM in asymptomatic boys was a rate of 4.2% [12]. In the present study, the rate of TM in patients with testicular pathology was 4.5%, and it was close to Goede's rates.

Previous studies reported that undescended testis is associated with a higher prevalence of TM [1, 3, 4]. In contrast, Pedersen and Chiang et al. revealed that the prevalence of TM in the asymptomatic population is similar to patients with undescended testis [5, 11]. In our study, the TM rate in patients with undescended testis was not statistically different from group 2. A study reported an increased incidence of TM in orchiopexy testes [13]. Similarly, we also found a higher prevalence of TM in patients with a history of orchiopexy. In our patients, TM was present in the operated testis and not in the contralateral

testis, which could be explained by the fact that orchiopexy may lead to vascular damage of the testis [1, 4, 14]. Although our cases are limited, our findings support this view.

Pain is a leading cause of hospital admission in men and children with TM [2, 5]. However, in many studies, no testicular pathology was found in patients presented with pain and were detected with TM on US [1, 2, 5]. In our study, seven (30.4%) patients with TM were admitted with the complaints of pain and were detected with no testicular pathology. Accordingly, the question to be asked is “Is TM itself a cause of pain?”. Further studies are needed on this subject.

Literature indicates that most pediatric studies on TM have been conducted by departments other than urology and pediatric surgery [1, 2, 6, 7]. In these studies, testicular pathologies were evaluated only based on US findings. In our study, however, patients who were examined in the pediatric surgery clinic and whose diagnosis was confirmed by US findings were included in the study. Accordingly, we consider that our study is different from other studies.

Our findings contradict with the studies suggesting an increased prevalence of TM in testicular pathologies. The high rate in previous studies may be explained by the more frequent use of imaging studies in these patients. Further studies and larger series are needed on this subject.

Our study was limited since it was a retrospective study and the clinical data of patients were retrieved from the hospital database. Another limitation was that all the US examinations were not performed by the same radiologist. In conclusion, we found no association between TM and testicular pathologies. Orchiopexy is likely to increase the prevalence of TM. Testicular pain may be a symptom of microlithiasis. Further studies are needed to elucidate the relationship between testicular pain and TM.

## Declarations

### Author contributions

Conceptualization: Sefa Sag; Methodology: Sefa Sag, Levent Elemen; Formal analysis and investigation: Sefa Sag; Writing - original draft preparation: Sefa Sag; Writing - review and editing: Sefa Sag, Kaan Masrabaci, Esma Karadeniz Gungormez; Supervision: Sefa Sag, Levent Elemen. All authors read and approved the final manuscript.

**Conflict of Interest:** The authors have no conflicts of interest to declare that are relevant to the content of this article.

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