BILATERAL TESTICULAR MICROLITHIASIS IN AN 11YEAR OLD BOY – CASE REPORT

BY

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Abstract
Testicular microlithiasis is an uncommon finding on scrotal ultrasound, particularly in children and is often seen incidentally whilst examining the scrotum on account of scrotal pain or undescended testis. The prognosis of testicular microlithiasis with infertility and malignancy increases with age and comorbid scrotal findings. Testicular pain and reduction in testicular volume may be related to the presence of testicular microlithiasis which is bilateral and of the classical type in the index case.

Keywords: microlithiasis, testis, scrotal ultrasound, testicular volume

Introduction
Testicular microlithiasis is characterized by the presence of microcalcifications in the testes often found incidentally on scrotal ultrasonography(Wilson et al. 2024), the microcalcifications or microliths usually measures 1-3mm with no posterior acoustic shadowing(Dudar 2018) and are spherical or ovoid and often bilateral(Dudar 2018, Yu et al. 2020). Testicular microlithiasis is described as the deposition of calcium in the seminiferous tubules and identified on scrotal ultrasound as punctuate non shadowing echogenic foci (Yu et al. 2020, A't Hoen et al. 2021).

The microliths can be diffusely spread throughout the testes known as the diffused type or concentrated in one area the focal testicular microlithiasis(Trout et al. 2017, Dudar 2018), unilateral or bilateral(Trout et al. 2017). The classification of testicular microlithiasis is limited when there are less than 5 echogenic foci in both testes and classic when there are 5 or more echogenic foci in one or both testes(Wang et al. 2015, Dudar 2018, Yu et al. 2020, Januś et al. 2023). The incidence of testicular microlithiasis in paediatric population is about 2%(Marin et al. 2023), the prevalence in boys is between 0.7% and 3.8%(Trout et al. 2017), being higher in patients with Down syndrome, Klinefelter syndrome and Undescended testis (Sağ and Başar 2023).

Sonography is the diagnostic modality of choice for testicular microlithiasis and was first described in 1987 by Doherty and coworkers (Dudar 2018). The index case of bilateral testicular microlithiasis of the classic type was found incidentally on scrotal ultrasound on account of scrotal pain, while the epididymis was discovered to be slightly enlarged and heterogenous suggestive of Epididymitis.

CASE REPORT

The index case is 11yr old male adolescent who presented to the general outpatient clinic with sudden pain in the scrotum, no postural change of pain on examination of both testes, there is no other genitourinary symptoms. Patient denied any history of trauma to the scrotum or penile discharge in the past before presentation.

After clinical evaluation and examination patient was requested to do some investigations including testicular ultrasound. Ultrasound shows multiple punctate calcifications in both testicular parenchyma (figures 1 and 2), with bilateral reduction in testicular volume (figures 3 and 4).

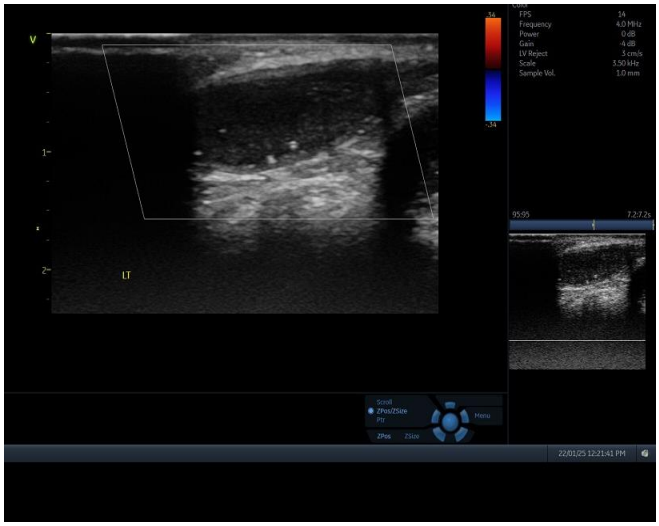

Figure 1: Longitudinal ultrasound showing testicular microlithiasis (classic) with multiple small punctate calcifications of varying sizes in the left testicular parenchyma.

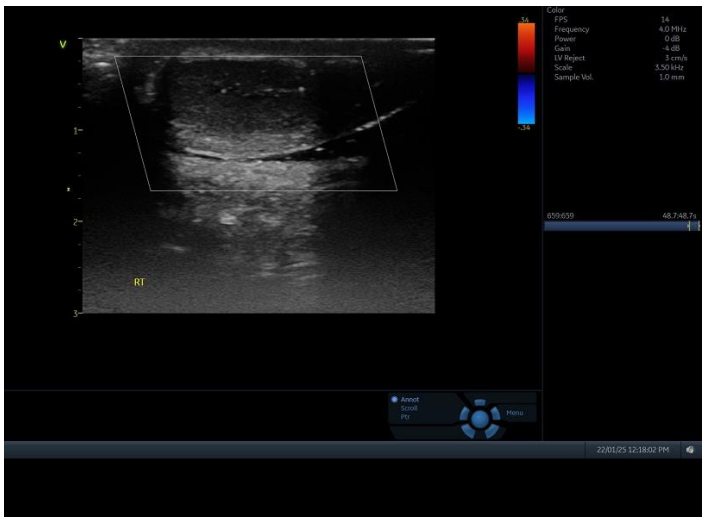

Figure 2: Longitudinal ultrasound scan showing testicular microlithiasis (classic) with multiple punctate calcifications in the right testicular parenchyma.

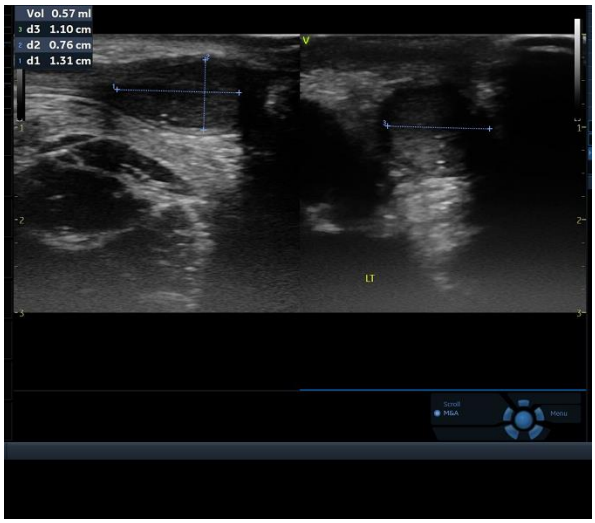

Figure 3: Longitudinal and transverse ultrasound scan of the left testis showing reduced left testicular volume.

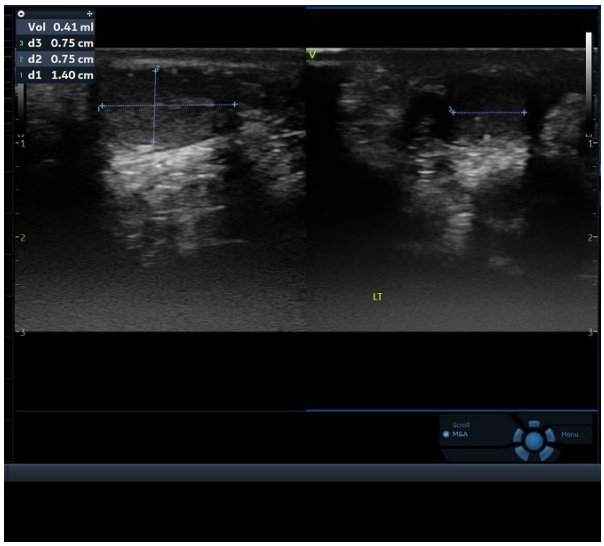

Figure 4: Longitudinal and transverse ultrasound scans showing reduced right testicular volume

Discussion

The aetiology of testicular microlithiasis is unknown, however suggested causative mechanisms include defective phagocytosis by sertoli cells(Leblanc et al. 2018, Januś et al. 2023), abnormal gonadal embryogenesis, trauma and genetic mutations in some individuals(Wilson et al. 2024).

The dysfunction of sertoli cells leads to accumulation of cellular debris in the testicular lumenwith impaired germ cell differentiation and spermatogenesis(Aoun et al. 2019), followed bydeposition of glycoproteins which eventually result in dystrophic calcifications and resultant laminated calcification(Dudar 2018)

The microscopic findings of testicular microlithiasis are of two types, haematoxylin bodies and lamellated calcifications(Balawender et al. 2018, Wilson et al. 2024), and these calcifications are composed of hydroxyapatite that are seen in the seminiferous tubules(Leblanc et al. 2018, Wilson et al. 2024).

Testicular microlithiasis can be graded into i(mild), ii(moderate), iii(severe) with

respect to the number of microliths in each testis, 5-10 microliths is grade i, 10-20 microliths is grade ii and more than 20 microliths is grade iii(Marte et al. 2017, Leblanc et al. 2018, Chaka et al. 2021, Marin et al. 2023).

Testicular ultrasound is the imaging modality of choice for diagnosis of testicular microlithiasis. Hydroxyapatite is responsible for the non shadowing echoes on the testicular parenchyma on ultrasound(Yilmaz et al. 2024). Magnetic resonance imaging of the scrotum can be used in children with suspicious finding on ultrasonography, location of undescended testis and to exclude coexisting testicular lesions.

Hormonal analysis can also be used as a complementary diagnostic tool. The serum levels of follicle stimulating hormone(FSH), luteinizing hormone(LH), testosterone as well as testicular volume can be used to evaluate the spermatogenic function of the testicles because the testicular volume may be lower in boys with testicular microlithiasis(3olak and LIzkan 2022).

Testicular biopsy may be considered in children with coexisting testicular lesions and associated risk factors because of its invasive nature and psychological impact(Chaka et al. 2021). The management consideration for testicular microlithiasis depends on patient age, clinical presentation and sonographic findings(Yilmaz et al. 2024). The index case was reviewed by the urologist and conservative management was instituted with ultrasonographic follow up advised.

The prognosis of testicular microlithiasis is favourable when it is unilateral, limited, focal ,and mild in classification and grading respectively, however the probability of testicular cancer increases when testicular microlithiasis is bilateral and there are coexisting risk factors such as cryptorchidism, gonadal dysgenesis, germ cell tumour and syndromes like Downs, Klinefelter, Peutz-Jeghers and Mccune-Albright(Dudar 2018, Yilmaz et al. 2024).

Recommendations

The transition between adolescent and young adult is a target age to develop testicular cancer hence follow up is recommended in children with testicular microlithiasis. Routine monthly testicular ultrasound is advised for children with coexisting risk factors. Tumour markers such as alphafetoprotein(AFP) and beta Humanchorionicgonadotropin(bHCG) in symptomatic children with testicular microlithiasis to exclude mitotic lesion.

In those children with isolated testicular microlithiasis reassurance of the child and family and regular testicular ultrasound follow up is recommended. Magnetic resonance imaging of the scrotum may be considered to exclude associated risk factors as well as for follow up of children with diffused, severe bilateral testicular microlithiasis.

References

A't Hoen, L., N. R. Bhatt, C. Radmayr, H. S. Dogan, R. J. Nijman, J. Quaedackers, Y. F. Rawashdeh, M. S. Silay, S. Tekgul and R. Stein (2021). "The prognostic value of testicular microlithiasis as an incidental finding for the risk of testicular malignancy in children and the adult population: A systematic review. On behalf of the EAU pediatric urology guidelines panel." *Journal of pediatric urology* 17(6): 815-831.

Aoun, F., A. Slaoui, E. Naoum, T. Hassan, S. Albisinni, J. M. Azzo, A. Kallas-Chemaly, G. Assenmacher, A. Peltier and T. Roumeguere (2019). "Testicular microlithiasis: Systematic review and Clinical guidelines." Progrиs en urologie 29(10): 465-473.

Balawender, K., S. Orkisz and P. Wisz (2018). "Testicular microlithiasis: what urologists should know. A review of the current literature." Central European Journal of Urology 71(3): 310.

Chaka, A., A. F. Daassa, W. Hamdouni, K. Ktari, R. Laamiri and A. Nouri (2021). "Pediatric testicular microlithiasis through four clinical case studies: review of the

literature and proposal of clinical guidelines." African Journal of Urology 27(1): 122.

Ɜolak, E. and B. Ɪzkan (2022). "Association Between Testicular Microlithiasis and Ultrasound-based Testicular Volume in Pediatric Population." Journal of Dr. Behcet Uz Children's Hospital.

Dudar, R. (2018). "Testicular Microlithiasis: Case Report and Current Knowledge." Journal of Diagnostic Medical Sonography 34(6): 490-494.

Januś, D., M. Wyjcik and J. B. Starzyk (2023). "Testicular microlithiasis in paediatric patients with Klinefelter syndrome from infancy till adolescence: early start of degenerative process in the testes—preliminary results." European Journal of Pediatrics 182(1): 225-235.

Leblanc, L., F. Lagrange, P. Lecoanet, B. Marɜon, P. Eschwege and J. Hubert (2018). "Testicular microlithiasis and testicular tumor: a review of the literature." Basic and clinical andrology 28: 1-10.

Marin, S. C., D. A. O. Beltran, D. M. G. Camargo, J. A. D. Vallejo, W. D. C. Galarza and I. A. Melo (2023). "Current state of research on testicular microlithiasis: A bibliometric analysis of the last five years' scientific literature." Revista cientнfica estudiantil 2 de Diciembre 6(4): e465-e465.

Marte, A., L. Pintozzi, G. Cretм, P. L. Chiesa, D. Di Renzo, M. Gasparella, G. Di Maggio, V. Bagnara, E. Merlini and B. Tadini (2017). "Long-term follow-up of testicular microlithiasis in children and adolescents: multicenter prospective cohort study of the Italian Society of Pediatric Urology." European Journal of Pediatric Surgery 27(02): 155-160.

Sağ, S. and D. Başar (2023). "Management of Testicular Microlithiasis in Children: A Single-Center Experience." Haydarpaşa Numune Medical Journal 63(2): 194.

Trout, A. T., J. Chow, E. R. McNamara, K. Darge, R. Ramirez Grueso, M. Munden, S. M. Rothan, O. M. Navarro, M. Tijerнn Bueno and K. E. Bove (2017). "Association between testicular microlithiasis and testicular neoplasia: large multicenter study in a pediatric population." Radiology 285(2): 576-583.

Wang, T., L. Liu, J. Luo, T. Liu and A. Wei (2015). "A meta-analysis of the relationship between testicular microlithiasis and incidence of testicular cancer." Urology Journal 12(2): 2057-2064.

Wilson, H. G., B. R. Birch and R. W. Rees (2024). "Is testicular microlithiasis associated with decreased semen parameters? a systematic review." Basic and Clinical Andrology 34(1): 1-14.

Yilmaz, M., C. H. C. Kong and T. Mostafa (2024). "Diagnostic and prognostic implications of testicular microlithiasis." Arab Journal of Urology: 1-5.

Yu, C.-J., J.-D. Lu, J. Zhao, Y. Wei, T.-X. Zhao, T. Lin, D.-W. He, S.-D. Wu and G.-H. Wei (2020). "Incidence characteristics of testicular microlithiasis and its association with risk of primary testicular tumors in children: a systematic review and meta-analysis." World Journal of Pediatrics 16: 585-597.