International Journal of Emergency Medicine

CASE REPORT

Open Access

Rapid testicular salvage in the emergency department using point of care ultrasound [POCUS]

Khaled Taha[1], Adrian Bonachera[2], Nicholas Hegarty[2], Edel Tivnan[1], Etimbuk Umana[1], Dimitris Smith Diakidis[1*], Jawad Mustafa[1], Tomás Breslin[1], Bassem Alhadi[1] and Erin Devlin[1]

Abstract

Background Testicular torsion is a time-sensitive urological emergency characterized by twisting of the spermatic cord, leading to ischaemia and, if untreated, necrosis. Young males under 25 are at the highest risk due to congenital defects like the Bell Clapper deformity. Prompt diagnosis and management are crucial.

Case presentation A 30-year-old male presented with severe right testicular pain, and point-of-care ultrasound (POCUS) in the Emergency Department confirmed torsion within a few minutes upon arrival to Emergency Department. Manual detorsion restored blood flow, confirmed by bedside Doppler imaging using POCUS within 15 min of arrival. The patient underwent successful bilateral orchidopexy.

Conclusion This case emphasizes the importance of early targeted emergency POCUS in recognizing and managing testicular torsion, ensuring optimal outcomes.

Keywords Testicular torsion, Point-of-care ultrasound, Emergency Medicine, Manual detorsion, Urological emergency

Introduction

Testicular torsion is a urological emergency, defined as a twisting of the spermatic cord which leads to reduction of blood flow to the testicle. This can lead to ischaemia, and if left untreated, eventual necrosis. Although it presents in all age groups with differing causes including birth defects and malignancy, it occurs most commonly is young males below the age of 25. This is due to the Bell Clapper deformity, involving a congenital defect of the tunica vaginalis, which leads to an incidence rate of 1 in 4000 in this particular group [1].

*Correspondence:
Dimitris Smith Diakidis
dimitris.smith@protonmail.com
[1] Emergency Department, Mater Misericordiae University Hospital, Dublin, Ireland
[2] Department of Urology, Mater Misericordiae University Hospital, Dublin, Ireland

Treatment is extremely time sensitive, and rapid identification is key to successful outcomes. Early detection with Point of Care Ultrasound (POCUS) can allow for increased testicular survival rates. Manual detorsion can procedurally reverse torsion and restore circulation particularly in an emergency setting. Both POCUS and manual detorsion technique have been used in isolation in the literature but there is limited evidence of combining both diagnostic and procedural techniques in an emergency setting in adults.

Case report

A 30-year-old male presented to our emergency department (ED) with sudden onset severe right testicular pain and vomiting 3 h prior. He denied any genito-urinary symptoms. His right testicle was swollen, extremely tender, and high riding. Intravenous (IV) Dexketoprofen Trometamol was given to alleviate symptoms. He was identified as having a potential organ-threatening

emergency at triage and an ED Consultant certified in emergency POCUS with over 10 years of experience was called, who immediately scanned the affected area. A GE machine was used, utilizing the linear probe on the testicular preset setting using transverse and longitudinal approach. The right testicle showed a complete absence of colour flow and hydrocele and free fluid, recognized as acute testicular torsion (Figs. 1 and 2) [2].

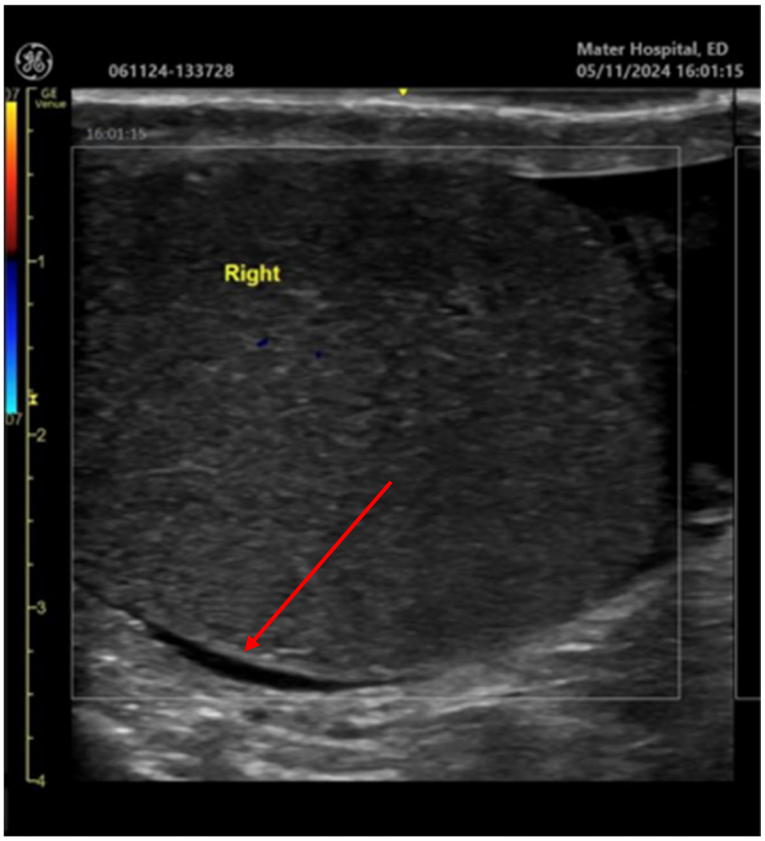

Fig. 1 Complete absence of Colour Doppler of swollen right testicle and free fluid [reactive hydrocele] at presentation of patient to ED confirming the diagnosis for acute right testicular torsion

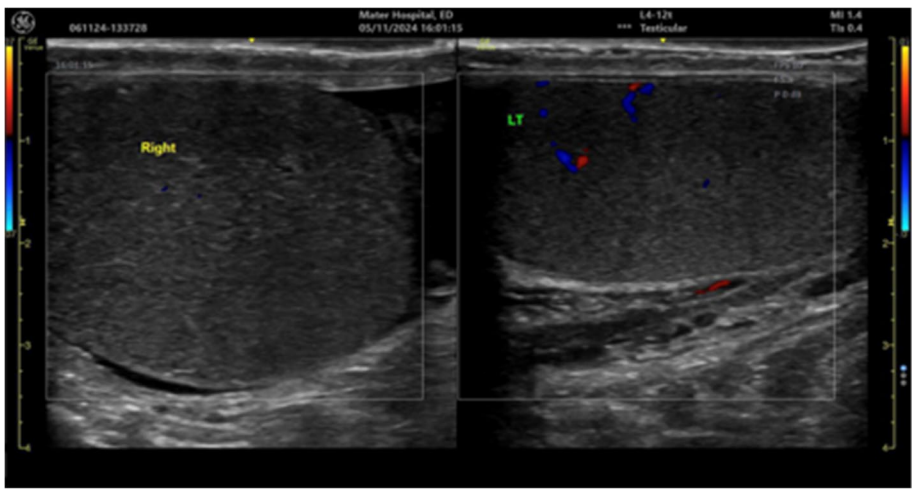

Fig. 2 Comparison of normal size and colour flow to left testicle compared to the torted right testicle

The Urologist on call was promptly contacted and arrived in the ED immediately afterwards. He attempted a manual de-torsion given the high clinical suspicion for testicular torsion confirmed on POCUS. He applied the open book technique, twisting the right testicle anti-clockwise 360 degrees resulting in full resolution of both the pain and the anatomical abnormality, with the patient`s pain threshold decreasing from 8/10 to 1/10.

Repeat POCUS was performed post-detorsion to ensure resolution, which showed complete restoration of the colour flow within the right testicle when compared to the initial scan (Figs. 3 and 4).

The patient's testicle was successfully detorted within 15 min from presentation to the ED. Patient underwent scrotal exploration the same day, and bilateral orchidopexy was done with 3 point fixation using 4.0 prolene.

Operative detail showed a healthy pink right testicle, similar to the contralateral testicle, confirming successful manual detorsion performed in the ED. The patient spent one night admitted and went home the next day with advice to wear scrotal support for one week.

Discussion

Acute testicular torsion is primarily a clinical diagnosis. Once suspected, immediate urological consultation should be sought. A bedside Doppler Study can efficiently confirm the clinical diagnosis. However, it is important to note that normal color Doppler flow does not completely

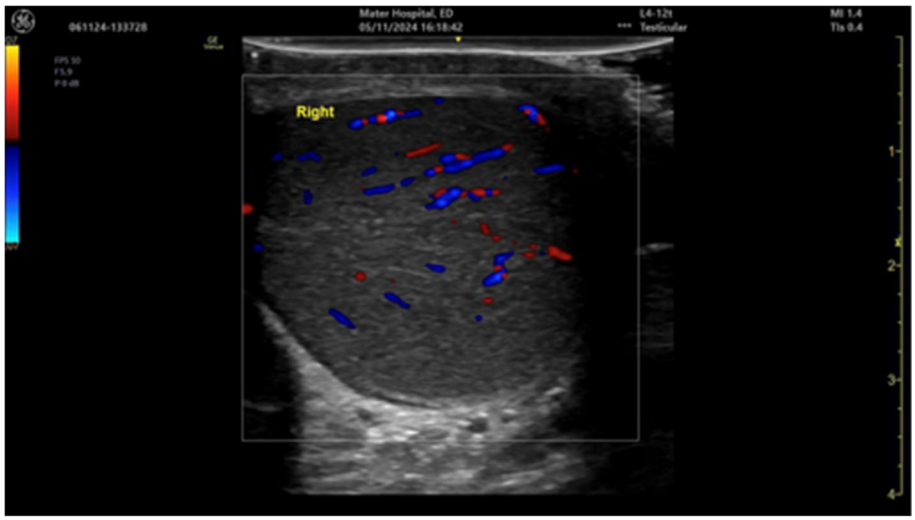

Fig. 3 Repeat Doppler showing complete restoration of circulation and colour flow to affected testicle

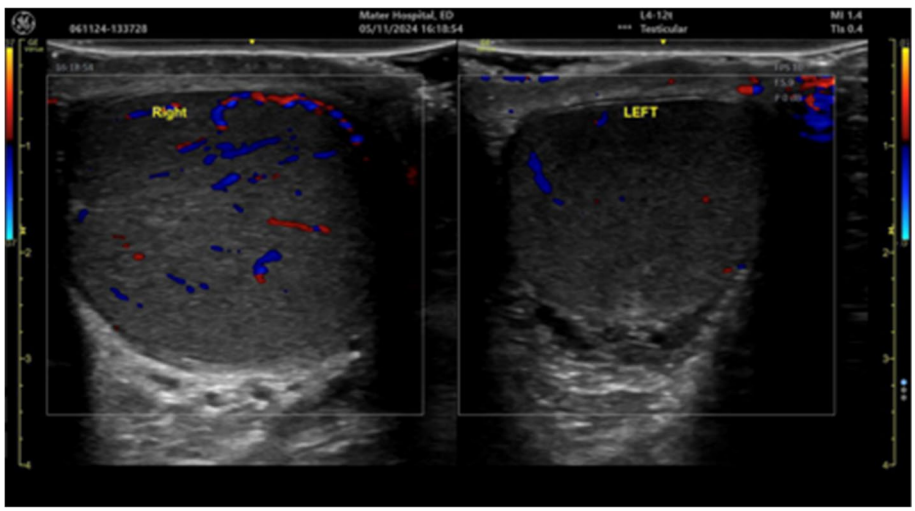

Fig. 4 Comparison of the saved testicle to the unaffected side showing even more colour flow after manual de-torsion in the ED

exclude torsion. In cases where clinical suspicion remains high, surgical exploration is warranted [1, 3, 4].

The management of testicular torsion in the ED is a time sensitive emergency to restore testicular function. This case underscores the utility of POCUS in diagnosing and managing testicular torsion. POCUS is highly sensitive and specific, enabling timely intervention, particularly in resource-limited or critical settings. Ultrasound-guided manual detorsion is an effective procedure in the hands of trained health care providers.

Color Doppler ultrasound is highly sensitive and specific for the diagnosis of testicular torsion, with reported sensitivity ranging from 88.9% to 100% and specificity from 97% to 98.8% when performed by trained personnel [1]. Loss of visual color flow to the affected testicle, high resistance arterial pattern in the spectral Doppler, enlargement of the affected testis, heterogenous echotexture, and spiral twisting of the spermatic cord ("whirlpool sign") are all characteristic findings [5]. However, it should be noted that the limitation of this investigation is dependent on the operator's skill and experience. It not only facilitates rapid diagnosis but also provides real-time feedback during manual detorsion to confirm the restoration of blood flow. This is critical because pain resolution alone may not guarantee complete detorsion; studies have shown residual torsion in up to one-third of cases when detorsion was performed blindly [1].

Manual detorsion in the emergency setting is increasingly recognized as an effective initial treatment for testicular torsion, especially when immediate surgical intervention is delayed. The traditional "open book" method (twisting the testicle outward) is commonly taught, but torsion can occur in various directions, necessitating ultrasound guidance to confirm both the direction of detorsion and restoration of vascular flow. Scheier E et al. described in their case report, a 360-degree detorsion relieved pain but required an additional 180-degree twist to achieve full reperfusion as visualized by Doppler [3]. Manual detorsion with ultrasound guidance by either Emergency Medicine physicians or Urologists is gradually being recognized as a more accepted form of initial management of testicular torsion, when used in conjunction with an eventual orchidopexy, particularly in the child to adolescent age group [3]. Although Nene et al. also reported the utility of POCUS and manual detorsion in a pediatric setting, it is in contrast to the age of our case (adult male 30 years old) [6]. Additionally, our case highlights the rapid detection and manual detorsion done with restoration of blood flow within 15 min. In a recent case report of a pediatric patient [7], the time from arrival to manual detorsion was over an hour.

Every minute counts in the management of testicular torsion. It is estimated that the chance of testicular viability decreases by 4.8% for every 10-min delay in treatment [8]. This underscores the importance of POCUS training for emergency physicians, enabling them to promptly diagnose and initiate treatment. EDs with POCUS and trained personnel can dramatically improve outcomes by reducing delays associated with transferring patients to radiology or waiting for specialist evaluations [4, 9].

The growing body of evidence supports integrating POCUS into routine emergency care for suspected testicular torsion [1, 3, 4, 10]. The ability to perform real-time evaluations and interventions such as manual detorsion improves patient outcomes while reducing dependency on specialist availability. Additionally, ongoing research into the comparison of blind versus ultrasound-guided detorsion will further refine this approach [10].

This case discussion reflects the critical advancements in diagnosing and managing testicular torsion, emphasizing the importance of rapid, effective interventions facilitated by modern tools like POCUS.

Conclusion

A high index of suspicion along with rapid access to equipment and trained physicians in POCUS enabled the early identification of testicular torsion. This resulted in early intervention and definitive management of this patient.

Authors' contributions

K.T. and E.U. were the ED Consultants who were main contributors in terms of clinically diagnosing the patient and confirming the diagnosis with POCUS. D.S.D. and J.M. were the ED SHOs who wrote the case report, with D.S.D. writing the abstract, case report, and conclusion, and J.M. writing the discussion and references. A.B. was the Urology Registrar who reviewed and admitted the patient in the Emergency Department. N.G. was the Urology Consultant who performed the orchidopexy procedure in theatre. E.T. was the Triage Nurse who first assessed the patient and alerted the ED doctors. T.B. and E.D. were the ED Consultants who proofread the case report. B.A. reviewed the structure of the case report and suggested changes. All authors reviewed the manuscript.

Funding

The authors of this case discussion received no funding for any part of this case report. They are all affiliated with, and/or employed by, Mater Misericordiae University Hospital in Dublin, Ireland.

Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

Ethics declaration not applicable.

Consent for publication

Informed consent was obtained from patient for participation and publication.

Competing interests
The authors declare no competing interests.

Received: 11 December 2024 Accepted: 22 February 2025
Published online: 17 April 2025

References

1. Hazeltine M, Panza A, Ellsworth P. Testicular torsion: current evaluation and management. Urol Nurs. 2017;37(2):61–71, 93 PMID: 29240370.
2. Bhagra A, Suravaram S, Schears RM. Testicular torsion–a common surgical emergency. Int J Emerg Med. 2008;1:147. https://doi.org/10.1007/s12245-008-0003-9.
3. Scheier E. Manual detorsion in pediatric testicular torsion: a narrative review of the literature. Urol J. 2024;91(3):628–31. https://doi.org/10.1177/03915603241229800.
4. Wilson T, Midgley S, Kummer T. Real-time ultrasound-guided manual testicular detorsion: a case report. West J Emerg Med. 2022. https://doi.org/10.5811/cpcem2022.6.57256.
5. Bandarkar AN, Blask AR. Testicular torsion with preserved flow: key sonographic features and value-added approach to diagnosis. Pediatr Radiol. 2018;48(5):735–44. https://doi.org/10.1007/s00247-018-4093-0.
6. Nene RV, Subramony R, Macias M, Campbell C, Aminlari A. Real-time point-of-care ultrasound for the diagnosis and treatment of testicular torsion. POCUS J. 2021;6(2):70–2. https://doi.org/10.24908/pocus.v6i2.15186. PMID: 36895665; PMCID: PMC9979951.
7. Scheier E, Gold B. Manual detorsion under sedation and POCUS. J Paediatr Child Health. 2024. https://doi.org/10.1111/jpc.16742. Epub ahead of print. PMID: 39663864.
8. Gold DD, Lorber A, Levine H, Rosenberg S, Duvdevani M, Landau EH, Yutkin V, Gofrit ON, Hidas G. Door to detorsion time determines testicular survival. Urology. 2019;133:211–5. https://doi.org/10.1016/j.urology.2019.08.003. Epub 2019 Aug 10 PMID: 31408640.
9. Williamson RCN. Torsion of the testis and allied conditions. Br J Surg. 1976;63(6):465–76. https://doi.org/10.1002/bjs.1800630618.
10. Sessions A. Manual testicular detorsion in the emergency department. J Emerg Med. 2020;58(3):1–5.

Publisher's Note