

NEONATAL TESTICULAR TORSION: A CASE REPORT ON MANAGEMENT OPTIONS FOR UNILATERAL NEONATAL TESTICULAR TORSION WITH TESTICULAR NECROSIS

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ABSTRACT

Neonatal testicular torsion (NTT) is a rare but serious condition affecting newborns, typically presenting within the first month of life. It involves twisting of the spermatic cord, compromising blood supply to the testis and leading to ischemia and necrosis if left untreated for 4 to 8 hours. This report discusses the case of a 10-day-old male infant who presented with an incidental finding of right testicular enlargement during a routine postnatal check-up. Ultrasound examination revealed right testicular necrosis secondary to torsion. The management of NTT, especially when necrosis is evident, remains controversial. While surgical exploration and unilateral orchidectomy are often recommended to prevent complications such as infection or malignancy, some advocate for conservative management due to the risks associated with anesthesia in neonates. This case also highlights the importance of contralateral orchidopexy to reduce the risk of future torsion in the unaffected testis. Overall, the case emphasizes the critical role of early diagnosis and timely intervention, which are essential to prevent complications, preserve fertility, and ensure optimal outcomes.

1.0 INTRODUCTION

Neonatal testicular torsion (NTT) is an uncommon but serious urological emergency occurring in neonates, often prenatally or within the first month of life [1-2]. It involves the twisting of the spermatic cord, obstructing blood flow and leading to ischemia [2, 7-8]. If not identified and treated promptly, ischemia can progress to necrosis within 4–8 hours [1-2, 8]. The estimated incidence of NTT is 6.1 per 100,000 live births, with extravaginally torsion being the most common subtype (85-90%) [2-3, 7, 9]. Risk factors include breech delivery, large-for-gestational-age infants, prolonged or difficult labor, and preeclampsia [6-9]. NTT often presents asymptotically, making early detection challenging during routine neonatal examinations [2, 7]. Clinical findings are firm and enlarged testis, tenderness, and sometimes discoloration of the scrotal skin [3, 6-7]. Diagnosis is primarily clinical, but imaging modalities such as scrotal ultrasound with Doppler can confirm findings and assess the blood flow for viability [7, 9]. This research discusses a case of a 10-day-old male infant diagnosed with right testicular torsion and necrosis during a routine postnatal visit. It highlights the importance of awareness regarding this rare condition, the need to differentiate between prenatal and postnatal NTT, and explores the diagnostic approaches and management challenges involved.

2.0 CASE PRESENTATION

A male infant was born at full term via spontaneous vaginal delivery with a full Apgar score, and a birth weight of 3.3 kg. The birth was uneventful, and he was discharged in good condition. He was referred by a medical officer at a health clinic on day 10 of life after an incidental finding of an enlarged, firm, and tender right testis. He was then brought to the hospital for further evaluation. Assessment at the hospital by the paediatric team showed that the neonate was well and thriving, with no other issues apart from the incidental finding of an enlarged right testis. Antenatally, the mother is Para 1+2 and has a history of two

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first-trimester miscarriages. The current pregnancy was unremarkable. He is the only child, and there is no family history of malignancy, genetic conditions, or recurrent torsion.

On examination as in Figure 1, the right testis was firm in consistency, enlarged to a size of 2×3 cm, non-tender on palpation, transillumination test negative, and with no overlying skin changes. The left testis was descended with normal size. Other systemic examinations were unremarkable.



Figure 1. Enlarged and elevated right testis, with normal appearance of the left testis

Scrotal ultrasound and Doppler as in Figure 2 revealed a right testis with heterogeneous echogenicity and an irregular outline. The testis demonstrated avascularity and measured 1.8 cm. There were foci of hypoechogenicity with specks of calcification. There was no hydrocoele. The left testis appeared normal with homogeneous echogenicity, measuring 1 cm, and a minimal left hydrocoele was noted. Normal vascularity was observed. No inguinal hernia was present bilaterally.

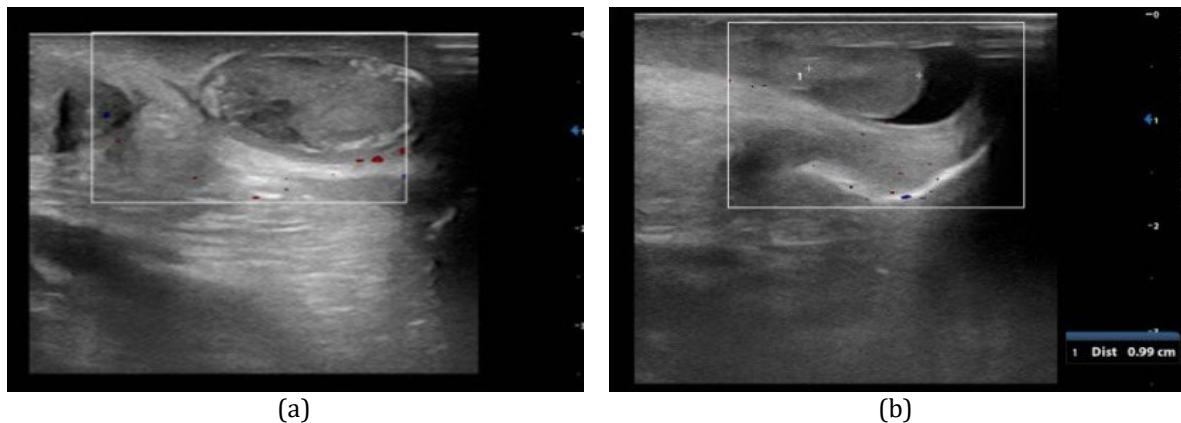


Figure 2. (a) The right testis shows heterogeneous echogenicity, with foci of hypoechogenicity and specks of calcification, (b) The left testis appears normal with homogeneous echogenicity

The laboratory workup was unremarkable for infection (white blood cell count: $11.7 \times 10^9/L$, platelet count: $389 \times 10^9/L$, haemoglobin: 16.3 g/dL, C-reactive protein: $<0.6 \text{ mg/L}$). The paediatric surgical team was consulted, and the overall impression was prenatal testicular torsion based on clinical findings and ultrasound results. Further evaluation by the paediatric surgical team at 3 months of age revealed sonographic evidence of right testicular necrosis and a viable left testis with a minimal hydrocoele. The neonate is currently under regular follow-up and monitoring by the paediatric surgical team in a tertiary care centre.

3.0 DISCUSSION

Neonatal testicular torsion (NTT), also known as perinatal testicular torsion, is a rare condition [6-8]. It refers to testicular torsion that occurs prenatally, at the time of birth (prenatal testicular torsion), or within the first month of life (postnatal testicular torsion), with the extravaginally type being the most common subtype among neonates [6-8, 14]. It occurs during the descent of the testis into the scrotum [8-9]. The presentation of NTT can be subtle; therefore, it may be missed during routine neonatal examinations, as

occurred in this case, where a 10-day-old male infant was noted to have a firm and enlarged right testis during a routine check-up [2, 7, 10]. Patients can be asymptomatic or may present with a firm, enlarged, and non-tender testis, possibly with skin discolouration [3, 6-7]. In this case, the patient was incidentally noted to have a firm, enlarged right testis with no erythema or other skin changes during a routine postnatal check-up.

Early detection and intervention are crucial in salvaging the testis [8], especially in cases of postnatal testicular torsion. Late intervention can lead to irreversible complications, as the twisted testis disrupts blood flow, leading to ischemia [2, 7-9]. When ischemia lasts for an extended period typically between 4-8 hours it can result in necrosis, leading to functional loss, and may also increase the risk of future torsion of the contralateral testis [2-3]. In this case, the right testis was found to be necrotic when scrotal ultrasound and Doppler were performed, suggesting that the torsion occurred prenatally. There is a low chance for prenatal testicular torsion to be salvageable, with only a 1% salvage rate for the affected testis (average ranging from 0% to 5%) [15]. In prenatal testicular torsion, the main concern is the potential risk to the contralateral testis, as it has a higher risk of future torsion [14]. Assessment of the contralateral testis and ensuring its viability are essential for hormonal and fertility preservation [14]. The diagnosis of testicular torsion can be made clinically through physical examination, but the utility of ultrasound (USG) and Doppler can help confirm the diagnosis and exclude other conditions such as hydrocele, malignancy, and hernia [6, 8]. It is also able to assess blood flow and vascularity of the torsed testis, as well as evaluate the contralateral testis [6, 8, 10]. USG has a high sensitivity and specificity of 89.9% and 98.8%, respectively, with a 1% false-positive rate [8-9].

Therefore, it is a reliable diagnostic tool for identifying testicular torsion and its complication, namely testicular necrosis. In testicular torsion, USG may show a whirlpool sign indicating coiled spermatic cords, as well as an increase in testicular size [5, 9]. In later stages, such as necrosis, heterogeneous echogenicity, calcifications, and absence of blood flow on Doppler may be observed [4-7, 9].



Figure 3. USG findings for testicular torsion showing whirlpool sign [5]

The management of testicular torsion in the presence of necrosis is controversial and complex, with differing points of view [7-8]. Testicular torsion is a surgical emergency, and early intervention is essential to prevent irreversible injury, typically via scrotal exploration and orchidopexy [2]. Complications arise primarily due to testicular ischemia, where the extent of damage depends on the duration of torsion and the degree of spermatic cord rotation [8]. The later the intervention is performed, the lower the likelihood of testicular salvage [5,8]. If the testis is already necrotic and the tissue is nonviable, orchidectomy should be performed [7-8]. This is because if left untreated, it can lead to infection, subsequent sepsis, and even malignancy [6-7, 9, 11].

Orchidopexy of the contralateral testis is also necessary, as it carries a risk of future torsion [1, 6-8]. In this case, there is a risk of torsion of the left testis, particularly since a hydrocoele is present [6,8]. Therefore, by performing contralateral orchidopexy, it helps ensure that the infant retains a functional testis for testosterone production and fertility preservation, despite the loss of the affected testis [6]. Due to the low chance of salvaging the testis in prenatal testicular torsion, most surgeons prefer to perform urgent scrotal exploration, ipsilateral orchidectomy, and contralateral orchidopexy after one month of age, to reduce surgical and anaesthetic risks during the neonatal period [6, 13]. However, there are surgeons who opt for non-surgical management because the torsed testis has a low salvage rate and is often already necrotic [6, 8]. This is because the surgical approach itself can lead to complications, both from the procedure and

from anaesthesia [3, 8-9]. The main factors contributing to these differing views are the risks associated with anaesthesia in newborns, as well as the potential consequences such as infertility and hypoandrogenism [8-9].

This method involves regular follow-up by the parents for frequent monitoring of complications related to the necrotic testis and the contralateral testis to prevent torsion [8]. Although this approach avoids surgery and anaesthesia, there is still a risk of future torsion of the contralateral testis [8], potentially causing additional stress for the parents and discomfort for the child [8]. Surgical and anaesthesia-related complications can be minimised by using a scrotal incision combined with caudal anaesthesia [7, 9, 12]. The increased use of caudal anaesthesia helps prevent the adverse neurocognitive effects associated with general anaesthesia [9, 12]. The scrotal incision technique is associated with a lower risk of spermatic cord or vasal injury and a reduced likelihood of future hernia formation, when compared to the inguinal incision approach [7, 9, 13]. However, as mentioned above, if the necrotic testis is left untreated and remains in situ, it is prone to developing future complications. Contralateral orchidopexy is also necessary to prevent torsion of the unaffected testis.

4.0 CONCLUSION

This case highlights the importance of early recognition, accurate diagnosis, and timely intervention in managing neonatal testicular torsion. Due to the rarity of the condition and its subtle clinical presentation, it is often underdiagnosed or misdiagnosed. The presence of testicular necrosis in this neonate indicates that testicular salvage was not feasible, necessitating an orchidectomy. Surgical intervention, including contralateral orchidopexy, is crucial to prevent further complications and to preserve future fertility. However, anaesthetic and surgical risks may influence decision-making regarding early surgery. Increased awareness among healthcare providers, routine scrotal examinations during neonatal check-ups, and parental education are essential to improve outcomes.

5.0 CONFLICT OF INTEREST

The authors declare no conflicts of interest.

6.0 AUTHORS CONTRIBUTION

Nur Ibtihal Hasan Al-Banna (Conceptualization; Literature review; Writing – original draft)
Muhammad Hanez Johari (Clinical data collection; Writing - critical revision intellectual content)
Mohd Faizul Amer (Writing - critical revision of the article for important intellectual content)

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