Radiology Case Reports 14 (2019) 278–281

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Case Report

Segmental testicular infarction following nephrectomy

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ARTICLE INFO

Article history:
Received 30 July 2018
Revised 14 November 2018
Accepted 14 November 2018
Available online 28 November 2018

Keywords:
Segmental
Testes
Infarction
Nephrectomy
Trauma

ABSTRACT

Segmental testicular infarction is a rare diagnosis and there are few documented cases in the literature. Those cases that have been reported are usually in the setting of epididymitis, hypercoaguable states, vasculitis, sickle cell disease, post orchidopexy or vasectomy, and idiopathic. We report a case of a patient who developed segmental testicular infarction that was managed conservatively, following nephrectomy for a ruptured kidney and the associated ultrasonographic appearances.

Introduction

Global infarction of the testes is a well-documented urological diagnosis with the majority of cases seen in relation to torsion. Less commonly it has also been seen in cases of incarcerated hernia, severe epididymitis, and iatrogenic injury [1]. Segmental or focal ischemia of the testes is a much rarer encounter with only case reports documented in the literature [2,3].

This is because the testes have a rich blood supply. The majority of its supply originates from the testicular artery but it gets supplementary supply from the cremasteric artery (branch of inferior epigastric) and artery of the vas (branch of inferior vesicular artery) which anastomose with branches of the testicular artery [4].

Nephrectomy is a common urological surgical procedure with 8128 procedures done in the UK in 2016 [5]. A small percentage of these are done as an emergency in the setting of trauma, which is often part of damage control or life-saving surgery.

Segmental testicular infarction secondary to traumatic nephrectomy to the best of our knowledge has not been previously reported.

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https://doi.org/10.1016/j.radcr.2018.11.012

Fig. 1 – Coronal contrast-enhanced CT of the abdomen and pelvis showing a shattered right kidney with extensive surrounding retroperitoneal hematoma (see asterisk).

Case report

A 29-year-old male, previously fit and well, suffered a direct impact from another player's knee to his right lumbar region during a game of football. He was initially seen at a district general hospital where he underwent a contrast-enhanced CT chest, abdomen, and pelvis. This revealed a ruptured right kidney with extensive retroperitoneal hematoma [Fig. 1]. He was subsequently transferred to a level 1 trauma center where he became hemodynamically unstable and underwent an emergency right nephrectomy. Thirty-two hours post operatively he developed sudden onset severe pain and swelling in the right testicle. Prior to surgery he had a GCS of 15 and reported no testicular pain.

On day 2 post operatively, a portable ultrasound (US) was performed at the bedside. This demonstrated an enlarged right testicle with heterogeneous echotexture and decreased vascularity throughout the superior and middle poles. Normal echotexture and vascularity was preserved in the inferior pole. There was no hydrocele and the right epididymis was unremarkable. The left testis and epididymis were normal in appearance. A provisional diagnosis of testicular ischemia was given and the patient underwent urgent clinical urological review which excluded torsion as a cause.

Repeat departmental ultrasound on day 3 postoperatively demonstrated segmental geographical areas of avascular hypoechogenicity in the superior and middle poles of the right testis with surrounding areas of heterogeneous echotexture. However, there was improved vascularity compared with previous day [Fig. 2 and 3]. A diagnosis of segmental testicular infarction secondary to iatrogenic injury to the gonadal vessels during life-saving right nephrectomy or at the time of initial injury was made.

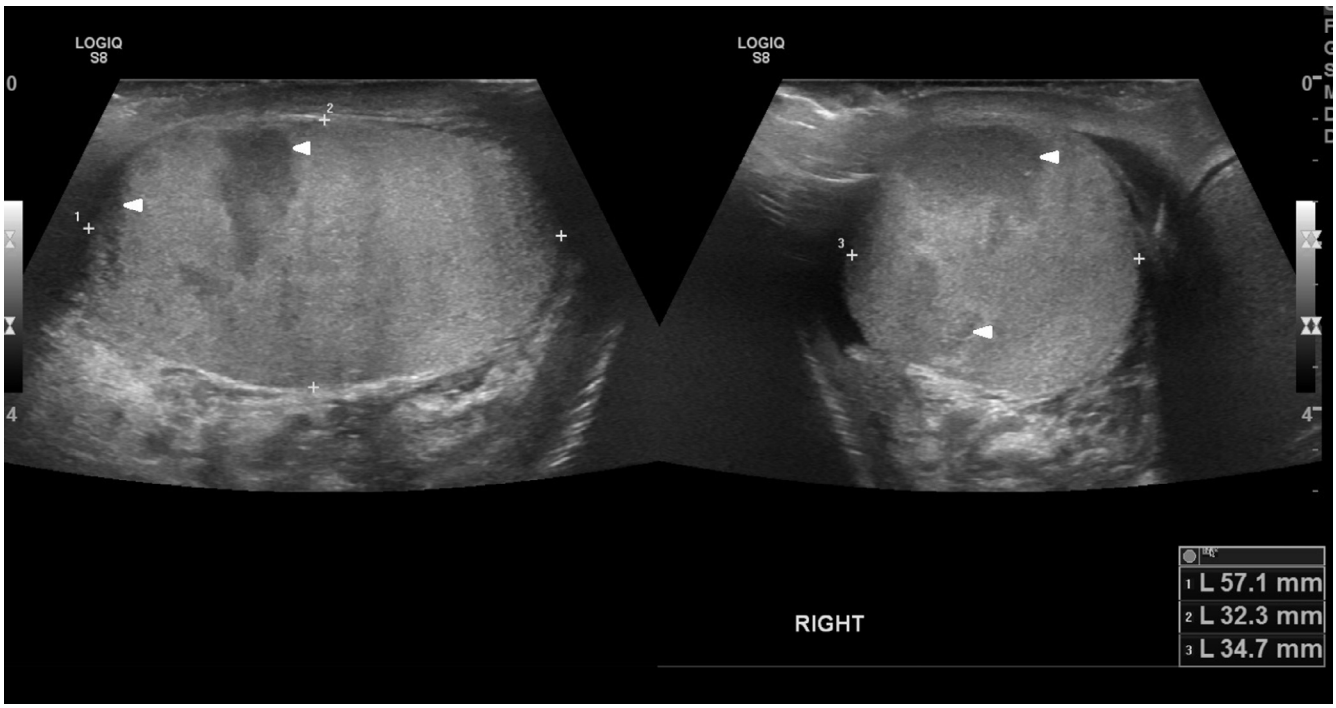

Fig. 2 – Sagittal and axial ultrasound images of the right testis showing well-demarcated areas of hypoechogenicity (see arrowheads) within the superior and middle poles. In addition, the background echotexture of the testis is mildly heterogeneous in the superior and middle poles.

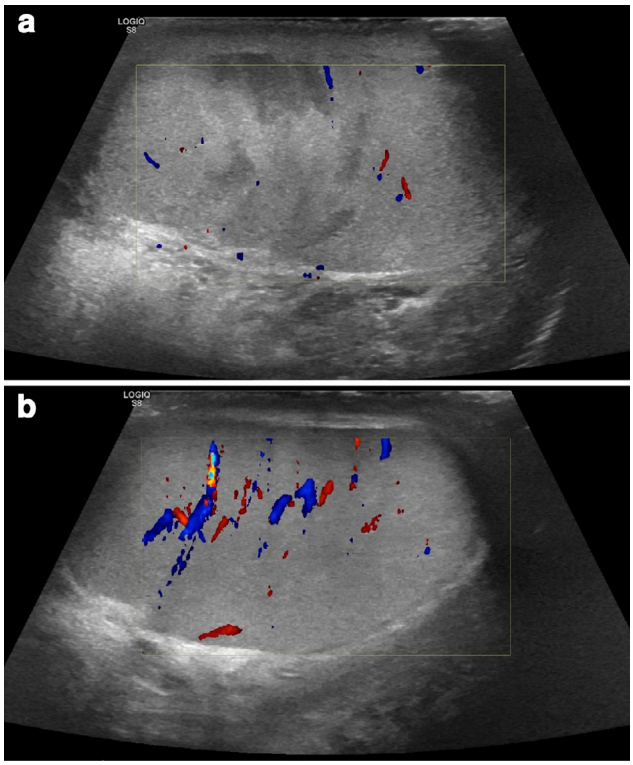

Fig. 3 – Sagittal ultrasound images of the right (a) and left (b) testes. Color Doppler demonstrates areas of hypoechoic avascularity in the right testis consistent with infarction and decreased vascularity in the remainder of the testis. Normal appearances of the left testis.

The patient was started on prophylactic antibiotics and managed conservatively, as opposed to the alternative option of surgical exploration, and followed up with repeat US on day 5. This revealed an unchanged appearance to the previously well demarcated, avascular areas of hypoechogenicity but reactive hyperemia in the remainder of the testes and epididymis [Fig. 4], given the stability of the changes the definitive plan was to continue with conservative management. At 6 months post injury the patient was asymptomatic and discharged from follow-up with no further imaging.

Discussion

Segmental infarction of the testes is a rare clinical entity. The previously documented cases include acute epididymitis [6], postsurgical (orchidopexy, and vasectomy), vasculitis, sickle cell disease and hypercoaguable states [7], and idiopathic [1,7]. Segmental testicular infarction as a result of nephrectomy has not been documented, although testicular pain has been documented following elective donor nephrectomy [8,9]. Given many thousands of nephrectomies are done in the UK each year, the fact that the surgical procedure was done in the setting of life-saving trauma surgery, with a shattered kidney, and large retroperitoneal hematoma, is likely to have increased the risk of injury to the testicular vessels. The exact mechanism of the focal ischemia is unknown but iatrogenic injuries to the testicular vessels during surgery, thrombus, or an embolus are amongst the hypothesized causes.

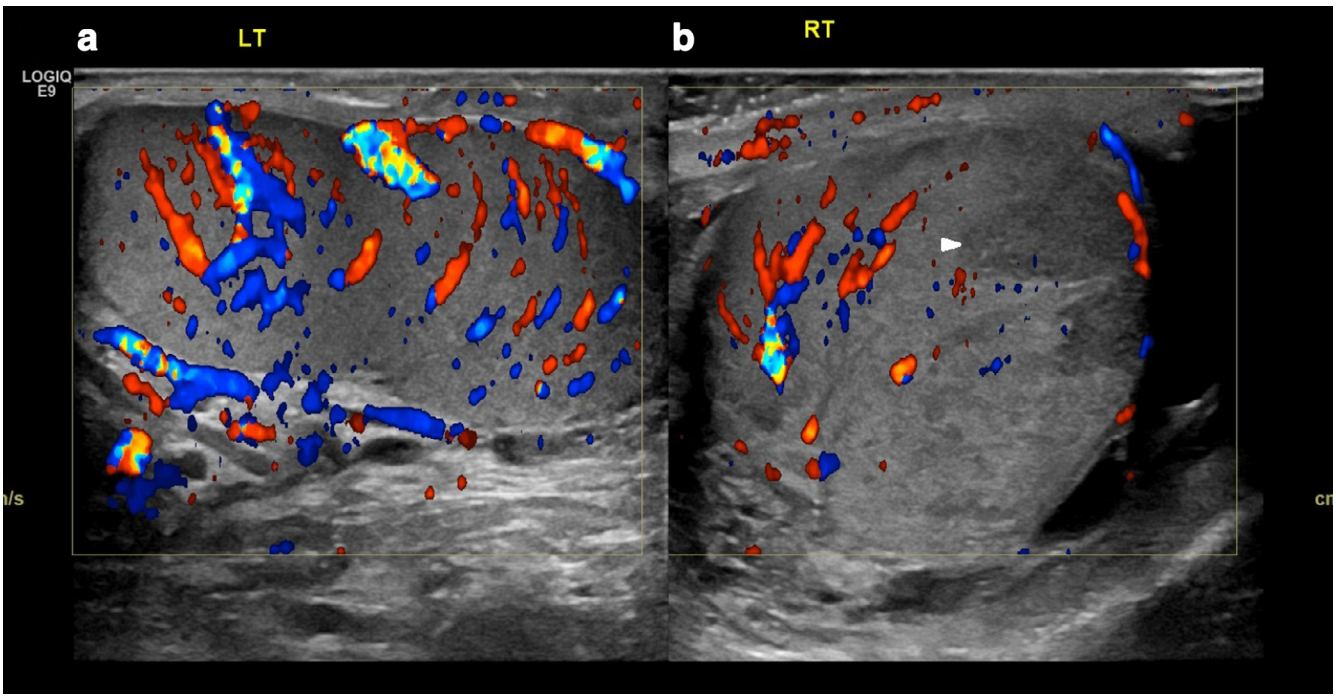

Fig. 4 – Ultrasound images of the left (a) and right (b) testes on day 5 postoperatively showing normal vascularity in the left testis and significantly improved vascularity in the right testis. However, there is persistently absent vascularity in the hypoechoic infarcted segments of the right testis (see example labeled with arrowhead).

The classic ultrasound appearances include regional or lobular areas of hypoechogenicity, which are avascular and well demarcated from normally appearing and enhancing testes. The epididymis appearances are variable depending on the underlying cause and may be normal or engorged and hypervascular in the setting of epididymitis.

Ultrasound is a reliable and easily reproducible imaging modality for evaluating segmental testicular infarction and has the added benefits of being able to be done at the bedside in the case of the clinically unstable patient.

Many cases of segmental testicular infarction in the literature have been treated with orchidectomy. This is often in the case of idiopathic presentation where the hypoechoic area of the testes has been described as a tumor [3] or when the diagnosis is in doubt preoperatively. In the appropriate clinical setting, where the diagnosis can confidently be made with a combination of clinical examination (to exclude torsion) and ultrasound imaging, conservative management with antibiotic cover and observation is an option. This allows preservation of hormonal and physiological function, and potentially some fertility preservation. In the setting of a patient who has already undergone life-saving nephrectomy it also has the added benefit of avoiding a repeat surgical procedure.

This case highlights an additional but rare complication of nephrectomy in the trauma setting, but one which can have significant impact on the patient. It highlights the appearances of segmental testicular infarction on ultrasound and should be considered in the differential in patients presenting with acute testicular pain post nephrectomy, particularly in the setting of trauma or emergency surgery.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.radcr.2018.11.012.

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