



## Trauma and Reconstruction

# Testicular Dislocation After Scrotal Trauma: A Case Report and Brief Literature Review



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## ABSTRACT

Traumatic dislocation of the testis is a rare event after blunt trauma of the scrotum or abdominopelvic injury. The diagnosis may be overlooked because of associated major injuries. In this study, we report on an adult who presented with a left traumatic dislocation of the testis after a falling astride injury. A brief literature review is also cited.

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## Introduction

Traumatic dislocation of the testis (TDT) is an uncommon sequel of scrotal trauma, occurring after direct pressure on the scrotum and dislocating the testis outside its normal position to the surrounding tissue, usually the inguinal region.<sup>1,2</sup> TDT may be a singular event<sup>1</sup> or associated with blunt abdominopelvic trauma.<sup>3</sup> Although TDT occurs more often at the time of injury,<sup>2</sup> in a few cases, a TDT has been recognized as a later event.<sup>4</sup> Ultrasound (U/S), color-flow Doppler U/S, and computed tomography (CT) are the main diagnostic tools of this condition.<sup>4</sup> Early diagnosis and treatment are recommended to preserve testicular function and to avoid the risk of malignant transformation.<sup>1</sup> In this study, we report on a case of TDT in an adult, with a brief review of this rare condition.

## Case presentation

A 27-year-old man was admitted to our Department 3 days after an injury from falling astride on a crossbar. The patient

subsequently noted that the left testis was moved to the left inguinal region. There was not a history of undescendent or retractile testis in the past. On physical examination, his perineum and penoscrotum region had small abrasions, whereas the left scrotum was empty without hematoma. The testis was palpable in the left inguinal region (Fig. 1). The rectal tone was normal. A urine sample showed no blood. A color Doppler U/S revealed that the left testis was located in the inguinal canal, with normal size, and adequate blood supply of the testis (Fig. 2). A left-sided inguinal operation was performed, which revealed an apparently healthy testis. The testis was pushed in the scrotum without tension, and through a transverse scrotal incision, fixation of the testis to the scrotum was performed. The patient had an uneventful recovery and was discharged on the first post-operative day.

## Discussion

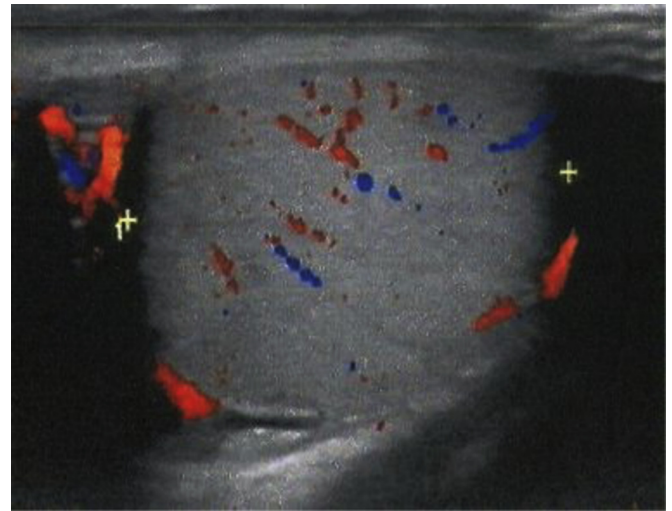
TDT, also referred as traumatic luxation of the testis as first reported by Clauby in 1818<sup>5</sup> when a victim had been run over by a wagon wheel. The exact incidence of TDT is not known, as the condition may be underreported or misdiagnosed.<sup>3</sup> We performed a search in PubMed and Google Scholar for articles published in the English language literature with the key words *traumatic testicular*

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**Figure 1.** The left testis is located in the inguinal canal with empty left hemiscrotum.



**Figure 2.** Color Doppler ultrasound demonstrating the normal blood flow of the dislocated testis.

*dislocation or testicular dislocation.* The results showed 47 reports (101 patients) published between 1965 and the present (Table 1). Most of them were case reports with brief review, and only 2 were retrospective studies (reports 25, 31). In most cases (80.2%), a TDT occurred after a motorcycle accident (Table 1). The mean age of the patient was 25.09 years (standard deviation 10.52), with a range from 6 to 62 years. Of note, only 2 patients were children (reports 31, 47). The percentage of unilateral TDTs vs bilateral TDTs was

almost equal (49.5% vs 50.5%, respectively). This finding was in contrast to other studies, in which the referred percentage of unilateral TDTs was almost 3 times that of bilateral.

The main mechanism of TDT is a direct force propelling the testis out of the scrotum, after rupture of the fasciae (external, cremasteric, and internal) of the spermatic cord.<sup>1</sup> Predisposing factors include a cremasteric muscle reflex, a widely open superficial inguinal ring, and the presence of indirect inguinal hernia and an atrophic testis.<sup>2</sup>

The most common site of dislocation is the superficial inguinal pouch (almost 50% of all cases).<sup>1</sup> Other less common sites of TDT are

**Table 1**  
List of the reported traumatic testicular dislocations in the English language literature between 1965 and present

Report	Author(s)/Journal	Number of Patients	Age, y	Mechanism of Injury	Unilateral/ Bilateral	Localization	Treatment
1	Morgan, <i>Br J Surg</i> 1965; 52: 669	4	9-20	RA: 2, SI: 1, MA: 1	Unilateral: 4	SIP: 4	CR: 1, operation: 3
2	Neistadt, <i>J Urol</i> 1967; 97: 1057	1	15	MA	Bilateral	Pubic	CR
3	Sethi, <i>J Urol</i> 1967; 98: 501	1	34	Run over a bullock cart	Unilateral	Prepuce	Operation
		1	40	Fall	Unilateral	Abdomen	NR
4	Boardman, <i>Injury</i> 1975; 7: 44	1	17	Fall	Bilateral	SIP	Operation
5	Goulding, <i>J Trauma</i> 1976; 16: 1000	1	22	MA	Unilateral	SIP	Operation
		1	20	MA	Unilateral	SIP	Operation
6	Edson, <i>J Urol</i> 1979; 122: 419-420	1	21	SI	Bilateral	SIP [R] Pubic [L]	Operation Rapture of the [L] testis
7	Kauder, <i>J Urol</i> 1980; 123: 606	1	23	MA	Bilateral	SIP	Operation [R], CR (L)
8	Foster, <i>J Urol</i> 1981; 126: 708	1	28	MA	Unilateral	SIP	Operation
9	Pollen, <i>J Trauma</i> 1982; 22: 247	1	22	MA	Bilateral	SIP	Operation
10	Nakarajan, <i>Urology</i> 1983; 22: 521	3	22-25	MA: 3	Bilateral: 1 Unilateral: 2	SIP: 3	Operation: 3 Spontaneous reduction (L): 1
11	O'Connell, <i>Br Med J</i> 1984; 77: 107	1	39	Fall	Unilateral	SIP	Operation
12	Koga, <i>Urol Int</i> 1990; 45: 310	1	17	MA	Bilateral	McBurney's point [R] Inguinal region [L]	Operation
13	Singer, <i>Urology</i> 1990; 35: 310	1	19	MA	Unilateral	Inguinal region	CR
14	Feder, <i>Am J Emerg Medicine</i> 1991; 9: 40	1	20	Hit during sexual relations	Unilateral	Abdomen	Operation
15	Lee, <i>Urology</i> 1992; 506	1	23	MA	Unilateral	SIP	Operation
		1	19	Automotive accident	Unilateral	SIP	Operation
16	Wright, <i>Injury</i> 1993; 24: 129	1	35	MA	Unilateral	SIP	Operation
17	Madden, <i>Acad Emerg Med</i> 1994; 1: 272	1	35	MA	Unilateral	SIP	CR

(continued on next page)

Table 1 (continued)

Report	Author(s)/Journal	Number of Patients	Age, y	Mechanism of Injury	Unilateral/Bilateral	Localization	Treatment
18	Schwartz, <i>Urology</i> 1994; 43: 743	1	38	Pedestrian-MVA	Unilateral	SIP	Operation
19	Toranji, <i>Abdom Imaging</i> 1994; 9: 379	1	19	MA	Unilateral	AAW	Operation
20	Hayami, <i>Urol Int</i> 1996; 56: 129	1	17	Car collision	Unilateral	SIP	Operation
21	O'Donnell, <i>Br J Urol</i> 1998; 82: 768	1 1	18, 20	MA: 2	Bilateral: 1 Unilateral: 1	SIP: [R], Internal ring: [L] Right hemiscrotum	Operation Operation
22	Tan, <i>Ann Acad Med Singapore</i> 1998; 27: 269	3	18-20	MA: 3	Unilateral: 2, Bilateral: 1	SIP: 3	Operation: 3, CR: 1
23	Yagi, <i>Urol Internat</i> 1999; 62: 188	1	25	Accident	Unilateral	Left thigh	Operation
24	Shefi, <i>Urology</i> 1999; 54: 744	1	22	MA	Unilateral	SIP	Operation
25	Kochakarn W, <i>J Med Assoc Thai</i> 2000; 83: 208	36	18-38	MA: 35 Run over by truck: 1	Bilateral: 30 Unilateral: 6	SIP: 34 (64 testis) Perineum: 1, Acetabular area: 1	CR: 14, Operation: 21, Orchectomy: 1
26	Yoshimura, <i>J Urol</i> 2002; 167: 1649	1	30	MA	Bilateral	SIP	Operation
27	Bromberg, <i>J Trauma</i> 2003; 54: 1009	1	33	MA	Bilateral	SIP	CR: [R], Operation: [L]
28	Blake, <i>Emerg Med J</i> 2003; 20: 567	1	21	MA	Unilateral	Right lower abdomen	Operation
29	Chang, <i>Am J Emerg Med</i> 2003; 21: 247	1	18	MA	Unilateral	SIP	CR
30	O'Brien, <i>J Urol</i> 2004; 171: 798	1	37	MA	Bilateral	Retovesical [R], SIP [L]	Operation
31	Ko, <i>An Emerg Med</i> 2004; 49: 371	9	6-53	MA: 7, Explosive: 1, Seat belt: 1	Bilateral: 2 Unilateral: 7	SIP: 3, Penile: 1, Pubic: 5	CR: 3, Operation: 5 Orchectomy: 1
32	Wu, <i>J Chin Med Assoc</i> 2004; 67: 311	1	40	MA	Bilateral	SIP	Operation
33	Bedir, <i>J Trauma</i> 2005; 58: 404	1	23	MA	Unilateral	Perineum	Operation
34	Vijayan, <i>Indian J Urol</i> 2006; 22: 71	1	18	RTA	Unilateral	SIP	CR
35	Sakamoto, <i>Fertil Steril</i> 2008; 90: E9	1	33	MA	Bilateral	SIP	Operation
36	Ezra, <i>Abdom Imaging</i> 2009; 34: 541	1	26	MA (FTI)	Bilateral	SIP	Operation
37	Kilian, <i>J Ultrasound</i> 2009; 28: 549	1	22	SI	Bilateral	SIP	Operation
38	Aslam, <i>Can Urol Assoc J</i> 2009; 3: E1	1	22	MA	Unilateral	Inguinal canal	Operation
39	Vasudeva, <i>J Emerg Trauma Shock</i> 2010; 3: 418	1	17	MA	Unilateral	SIP	Operation
40	Phuwapraisrisan, <i>J Med Assoc Thai</i> 2010; 93: 1	1	27	MA	Unilateral	SIP	Operation
41	Perera, <i>J Clin Imag Sci</i> 2011; 1: 17	1	30	MA	Unilateral	SIP	Operation (PTT)
42	Tsurukiri, <i>Abdom Imaging</i> 2011; 19: 379	1	32	MA	Bilateral	Perineum	Operation
43	Naseer, <i>Ann R Coll Surg Engl</i> 2012; 94: e109	1	53	MA	Unilateral	SIP	Operation
44	Smith, <i>J Surg Orthop Adv</i> 2012; 21: 162	1	23	MA	Bilateral	SIP	Operation
45	Sinasi, <i>Hong Kong J Emerg Med</i> 2012; 19: 295	1	26	MA	Unilateral	SIP	CR
46	Boudissa, <i>Orth Traum Surg Res</i> 2013; 99: 485	1	62	MA	Bilateral	Intrapelvic (R) Inguinoscrotal canal (L)	Operation
47	Matzek, <i>J Emerg Med</i> 2013; 45: 537	1	10	SI	Unilateral	SIP	Operation

AAW, anterior abdominal wall; CR, closed reduction; FTI, fuel tank injury; L, left; MA, motorcycle accident; MVA, motor vehicle accident; NR, nonreported; PTT, partial testicular torsion; R, right; RA, road accident; RIH, right inguinal hernia; RTA, road traffic accident; SI, straddle injury; SIP, superficial inguinal canal.

as follows: pubic (18%), penile (8%), canalicular (8%), truly abdominal (6%), perineal (4%), acetabular (4%), and crural (2%).<sup>2</sup>

Physical examination reveals a palpable mass consistent with a displayed testis and an empty hemiscrotum.<sup>3</sup> However, the diagnosis of a TDT may be initially overlooked because of the coexistence of other severe injuries.<sup>3</sup> A history of retractile testis or unrecognized cryptorchidism should be excluded.

A preoperative U/S and color Doppler U/S are usually the first line methods to evaluate a TDT. Color U/S is not only useful for the diagnosis of a TDT, but also in determining the blood flow of the testis.<sup>3</sup> Abdominal and pelvic CT scans are helpful in the cases of intra-abdominal dislocation<sup>1</sup> or the presence of associated pelvic and scrotal trauma.<sup>3</sup>

Manual reduction or surgical exploration is the treatment of choice in the case of a TDT. An attempt for manual reduction may be considered in the first 3–4 days after dislocation when edema has been subsided and before adhesions formation.<sup>1</sup> However, manual reduction is believed to be successful in only 15% of the cases.<sup>1</sup> Reasons for that include the small size of the defect in the spermatic cord layers,<sup>1</sup> the presence of edema, the possibility of further injury of the testis because of the force needed for restoration,<sup>4</sup> and the risk of a future dislocation or torsion.<sup>1</sup> On the basis

of these assumptions, a manual reduction was not performed in our case. Surgical exploration is advised<sup>4</sup> as the proposed treatment, as it is relatively minor, carries low morbidity, and may reveal an underlying testicular torsion or a coexistence of testicular trauma.<sup>3</sup> Nevertheless the treatment of choice, an early intervention is recommended as biopsies in the case of a delayed reposition of dislocated testes beyond 4 months have shown histologic changes, including absence of spermatids, decreased spermatogonia, the presence of germ cells, and an increase in alternative germ cells.<sup>2</sup> However, an improvement of spermatogenesis after treatment as long as 15 years after a TDT has also been reported.<sup>2</sup>

## Conclusion

Testicular dislocation is a rare complication of blunt scrotal trauma, usually occurring after motorcycle accident. A meticulous examination of the scrotum is recommended especially in the presence of multiple injuries. U/S and color Doppler U/S are the most useful tools in evaluation of a TDT, whereas a CT scan may be useful in the case of a complex trauma. As TDT is not a lethal condition, a careful plan of restoration of the testis is advised.

**Conflict of interest**

The authors have no conflicts of interest.

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