Imaging of inguino-scrotal urinary bladder hernias 2

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ABSTRACT

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Background: Herniation of urinary bladder through the inguinal canal is a rare disease that requires surgery. The resulting combination of failure of the abdominal wall and an increase in intra-abdominal pressure occurs prolapse of the urinary bladder in the inguinal canal and the occurrence of inguino-scrotal hernia.

Case Presentation: This phenomenon is very rare and often misdiagnosed. It occurs more often in older men with increased body weight and symptoms of distal urinary obstruction and urinary infections. The symptoms usually are mild to moderate, associated with hindered urination and urinary infections, and if this condition is promptly left untreated it can lead to serious health problems, such as renal failure. computed tomography reconstruction in three planes is the method of choice in the diagnosis of

inguino-scrotal hernia of the bladder. 13 Conclusion: This method provides a clear display of the herniated part of the urinary bladder and allows detection of the contents of the hernia sac. 14

Keywords: CT, inguino-scrotal hernia, urinary bladder, US, contents of the hernia sac.

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16 Background

Inguino-scrotal bladder hernia (ISBH) was first described 17 by Levine in 1951 as a scrotal cystocele. [1] About 1%-4% 18 of inguinal hernias involve the bladder. In overweight older 19 men, the percentage of bladder involvement in inguinal 20 hernias is higher and can reach up to 10%. Causes of blad-21 der herniation include distal urinary obstruction, chronic 22 urinary tract infections, and increased intra-abdominal 23 bladder emptying pressure [2,3]. Distal urinary obstruction 24 is most commonly caused by benign prostatic hyperplasia 25 (BPH) leading to incomplete bladder emptying [4]. ISBH 26 usually does not cause any specific symptoms and is there-27 fore often misdiagnosed [5]. Most often there is a com-28 pressible mass in the inguinal scrotal region that varies in 29 size, and there is difficulty urinating. Urination takes place 30 in two acts, the first is spontaneous emptying of the blad-31 32 der and the second is compression of the inguinal scrotal mass and emptying of the bladder [3]. A giant ISBH is very 33 rare and usually requires surgery. [6] They usually do not 34 cause any specific symptoms and are therefore often mis-35 diagnosed [7]. If left untreated, they can lead to serious 36 health problems, such as renal failure [8,9]. 37

38 Our goal is to emphasize the value of computed tomography (CT) in the diagnosis of inguinal scrotal bladder her-39 nia as a method that provides accurate diagnosis and clear 40

presentation of the hernia in multiple planes. This enables 41 the undertaking of appropriate measures by the surgeons 42 for permanent remediation of the condition. 43

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Case Presentation

We present a series of two patients aged 75 and 76 years 45 with a large inguino-scrotal hernia of the bladder. Patients 46 underwent abdominal CT, native, and post-contrast series 47 in three stages. The examination was performed on a GE 48 Brightspeed MDCT computed tomography device with 49 16 rows of detectors. The recording is carried out at a pipe 50 voltage of 120 kV. The rotation speed is 0.8 seconds. The 51 pitch factor is 1.375: 1. The recording is carried out in 52 an automatic mA setting (Auto mA) and usually ranges 53 from 100 to 400 mA. The cross-sectional thickness of the 54 native series is 1.5 mm, and that of the post-contrast series 55 is 1.25 mm. The noise index is 13. The maximum wide 56 field of view is used. The reconstruction matrix is 512 \times 57 512 pixels. 58

The first patient was a 76-year-old man with pain in the dis-59 tal part of the abdomen. The patient came to the emergency 60 center of our hospital. After clinical and laboratory examina-61 tions, acute appendicitis was suspected and the patient was 62 sent for abdominal CT. The reason for the CT examination 63

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was abdominal and pelvic pain. A right-sided inguinal blad-64 der hernia was found as a random finding (Figures 1 and 65 2). This is a direct inguinal hernia of part of the bladder. 66 Apart from intraperitoneal adipose tissue and part of the 67 bladder, there were no small intestinal loops in the hernia 68 69 sac. The patient had an increased prostate volume in addition to BPH. The prostate had a homogeneous structure, 70 clearly bounded by surrounding structures, with no signs of 71 infiltration of the periprostatic space. Reconstruction of the 72 sagittal and coronary planes was carried out to provide an 73 even clearer picture of bladder herniation. 74 The second patient was a 75-year-old overweight man 75 76 with pain in the distal part of the abdomen and the symptoms of distal urinary obstruction. After clinical 77 and laboratory examinations, distal urinary obstruction 78 is suspected and the patient was sent for abdominal CT. 79 80 The reason for the CT examination was abdominal pain and distal urinary obstruction. The patient complained 81 82 of swelling in the right inguinoscrotal region which was of variable size, as well as difficulty in urinating 83 in favor of distal urinary obstruction. In the patient, the 84 prostate was markedly enlarged, impresses the bladder, 85

and extends into its lumen (Figure 3). The prostate was 86 relatively clearly demarcated, with a homogeneous 87 structure in addition to BPH. The bladder had a thick-88 ened wall and much of the bladder had herniated into 89 the inguinal canal and descended in to the scrotum. It 90 is a direct inguinal hernia of most of the bladder. Apart 91 from intraperitoneal adipose tissue and part of the blad-92 der, there were no small intestinal loops in the hernia sac. 93 Reconstruction of the sagittal and coronal planes was 94 carried out to provide an even clearer picture of bladder 95 herniation (Figures 4 and 5). The patient also underwent 96 a Ultrasonography (US) examination of the small pelvis 97 and inguino-scrotal region, giving a clear visualization 98 of a bladder impressed by an enormously enlarged pros-99 tate (BPH) with visible herniation in the inguinal canal. 100 An exploration of the right inguinal scrotal region was 101 carried out with a linear probe, clearly visualizing the 102 herniated part of the bladder in the scrotal sac (Figure 6). 103

Discussion

In the cases presented, patients have a pronounced direct 105 inguinal hernia of part of the bladder, without pronounced 106



Figure 1. (A and B). Direct inguinal bladder hernia in a 76-year-old man. Axial CT images of the abdomen (arterial phase) at the level of the pelvis. Axial CT scan showing a herniation of part of the bladder in the inguinal canal (arrow).



Figure 2. (A and B). Direct inguinal bladder hernia in a 76-year-old man. Axial CT images of the abdomen (late phase) at the level of the pelvis. Axial CT scan showing a herniation of part of the bladder in the inguinal canal (arrow).



Figure 3. (A and B). Direct inguinal hernia of the right bladder in a 75-year-old man. Axial CT sections of the abdomen (late stage) at the level of the pelvis. Axial CT scan showing a herniation of part of the bladder in the right inguinal canal with propagation to the scrotum (arrow).



Figure 4. (A and B). Coronary reconstruction of CT of the abdomen (late stage). The CT reconstruction in the coronary plane showing a direct inguinoscrotal hernia of the bladder (arrow).



Figure 5. (A and B) Sagittal reconstruction of CT of the abdomen (late stage). The CT reconstruction of the sagittal plane showing a direct inguinoscrotal hernia of the bladder (arrow).



Figure 6. Direct inguinal hernia of the right bladder in a 75-year-old man. US examination of the pelvis and inguinoscrotal region: (a) clear visualization of a bladder impressed by an enormously enlarged prostate (BPH) with visible herniation in the inguinal canal (arrow); (b) exploration of the inguinoscrotal region with a linear probe. Clear visualization of the herniated part of the bladder in the scrotal sac (arrow).

107 symptomatology and present complications, especially without signs of chronic renal impairment. Surgical treat-108 ment of inguinal, ISBH was recommended in both patients. 109 The share of the bladder in inguinal and inguinal scrotal 110 hernias was less than 4% and could reach up to 10% in the 111 elderly with overweight [10]. Predisposing factors may 112 be overweight, weakness of the distal musculature of the 113 abdominal wall, and distal urinary obstruction, most com-114 monly caused by BPH [2-4]. More commonly, it is a direct 115 inguinal bladder hernia that may be confined to the ingui-116 nal canal or may have extended to the scrotum. Most cases 117 are asymptomatic and are usually diagnosed accidentally 118 [5]. If an enlarged prostate is present, patients usually 119 complain of difficulty urinating, rather than the inguinal 120 hernia itself. Therefore, these patients are most commonly 121 diagnosed with BPH, and the inguinal or inguinal scrotal 122 hernia of the bladder is overlooked [11]. 123 124 US, especially CT of the lower abdomen and scrotum, can help diagnose a bladder hernia, especially in cases where 125

there is comorbidity [12,13]. However, scrotal compression to initiate urination is characteristic of this condition
and may lead to an accurate diagnosis [3]. Both US and
CT of the lower abdomen and scrotum may assist in the
diagnosis of ISBH [7,14].

The bladder is involved in less than 4% of all inguinal 131 hernias and most cases are undiagnosed before surgery 132 [10]. Most bladder hernias are direct, with 70% being 133 male-dominated, and most cases occurring on the right 134 side [3]. Bladder hernias are anatomically classified into 135 paraperitoneal which is the most common type, followed 136 137 by intraperitoneal and extraperitoneal [3]. Our cases were of the direct inguinal hernia type where the intraperitoneal 138 139 bladder is herniated.

140 Factors involved in the pathophysiology of bladder hernia

141 include distal urinary obstruction (BPH), strictures of the

bladder neck and urethra, decreased bladder tone, pelvic 142 muscle weakness, and overweight [2,3]. In our case, the 143 cause of bladder herniation is BPH, decreased bladder 144 tone, and muscle weakness of both the abdominal wall 145 and the pelvic muscles. 146

Small bladder hernias are usually asymptomatic and are 147 usually diagnosed accidentally during surgery or CT scan 148 for other abdominal pathology [14,15]. Large inguinal scro-149 tal hernias present in two stages of urination, with the first 150 stage occurring spontaneously and the second stage requir-151 ing active manual compression of the hernia by the patient 152 to empty residual urine. Non-specific urinary symptoms 153 such as frequent urination, an urgency to urinate, noctur-154 nal urination, dysuria, and hematuria may be due to distal 155 urinary obstruction or urinary tract infection. In such cases, 156 inguinal tenderness may occur during urination due to soft 157 tissue enlargement in the groin area due to ISBH. 158

The diagnosis is made based on clinical findings, medical 159 history, physical examination, and radiological examina-160 tion. Radiological examinations are crucial in making a 161 diagnosis of ISBH. The methods used are conventional 162 radiological methods such as retrograde cystography, 163 intravenous urography, pyelography, and imaging meth-164 ods such as US and CT. US and CT are the methods of 165 choice in evaluating the distal abdomen and scrotum 166 [7,10,12-15]. Anatomical deformities, such as all poten-167 tial complications such as bladder or bowel infarction, 168 are easily detected. Of course, if the US examination of 169 the inguinal region detects a collection of fluid, it should 170 be taken into account that there may be an ISBH. Other 171 key diagnostic moments are visualization of tissue in the 172 inguinal canal and scrotal sac with similar echogenicity to 173 that of the bladder, visible connection to the bladder, and 174 variation in the dimensions of the inguinal contents before 175 and after bladder emptying [7,12]. 176

CT has recently been used quite often to visualize inguinal 177 hernias before they are treated surgically. This allows the 178 contents of the hernia to be visualized, as well as to rule 179 out the incarceration of herniated intestinal loops. This 180 increases the possibility of preoperatively diagnosing the 181 182 presence of a bladder hernia in the inguinal scrotal region [10,13-15]. CT is considered to be a particularly useful 183 method not only for the detection of bladder hernias, but 184 also for the detection of the contents of the hernia, which 185 may include part of the intestine, omentum and, of course, 186 the present complications such as strangulation and blad-187 der infarction or alteration of the intestinal vesicles [15]. 188 189 CT is particularly useful for showing bladder herniation in three planes, for detecting the contents of the hernia, and 190 what is of particular importance is not invasive compared 191 with retrograde cystography. It allows planning for surgi-192 193 cal treatment of a bladder hernia and reduces the risk of possible complications. 194

Conclusion 195

We can conclude that CT is the method of choice in the 196 diagnosis of inguino-scrotal hernias of the bladder. This 197 method provides a clear view of the herniated part of the 198 bladder, and also allows detection of the contents of the 199 hernia sac because in it can be found small intestinal ves-200 icles. The method is easy to perform, non-invasive, the 201 patient is in a comfortable position, and no hospitalization 202 is required to perform the diagnostic procedure. Three-203 plane CT reconstruction is the best technique for diagnos-204 ing bladder hernias and, most importantly, is non-invasive 205 compared to retrograde cystography. CT is superior in 206 207 the diagnosis of bladder herniation compared to all other 208 diagnostic methods available to us.

What is new?

Urinary bladder hernias usually do not cause any specific symptoms and are therefore often misdiagnosed. If left untreated, they can lead to serious health problems, such as renal failure. Our goal is to emphasize the value of computed tomography in the diagnosis of inguinal scrotal bladder hernia as a method that provides accurate diagnosis. This enables the undertaking of appropriate measures by the surgeons for permanent remediation of the condition.

List of Abbreviations 209

- Benign prostate hypertrophy 210 BPH
- СТ Computed tomography 211
- 212 FOV Field of view
- 213 ISBH Inguino-scrotal bladder hernia
- 214 PR prostate
- UB 215 Urinary bladder
- US Ultrasonography 216

217 **Conflict of interest**

- The authors declare that there is no conflict of interest regard-218
- ing the publication of this article. 219

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Ethic	cal approval is not required at our institution to publish an
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Refe	erences
1.	Casas JD, Mariscal A, Barluenga E. Scrotal cystocele:
	US and CT findings in two cases. Comput Med Imaging
	Graph. 1998;22(1):53–6. https://doi.org/10.1016/
,	Oruc MT Akhulut 7 Ozozan O Coskun F Urological
	findings in inguinal hernias: a case report and review
	of the literature. Hernia. 2004;8(1):76–9. https://doi.
	org/10.1007/s10029-003-0157-6
5.	Schaeffer EM, Bhayani SB. Inguinal bladder hernia.
	Urology. 2003;62(5):940. https://doi.org/10.1016/
	Chung SD. Chang HC. Liu PF. Chiu B. Bladder outlet
	obstruction associated with inguinal bladder hernia.
	Incont Pelvic Floor Dysfunct. 2008;2(2):77–8.
	Kim KH, Kim MU, Jeong WJ, Lee YS, Park KK, Chung MS,
	et al. Incidentally detected inguinoscrotal bladder hernia. Korean Lilrol 2011;52(1);71–3 https://doi.org/10.4111/
	kju.2011.52.1.71
	Bisharat M, O'Donnell ME, Thompson T, MacKenzie
	N, Kirkpatrick D, Spence RA, et al. Complications
	of inguinoscrotal bladder hernias: a case series.
	s10029-008-0389-6
<i>'</i> .	Catalano O. US evaluation of inguinoscrotal bladder her-
	nias: report of three cases. Clin Imaging. 1997;21(2):126-
	8. https://doi.org/10.1016/S0899-7071(96)00018-6
5.	Abaza R, Rashid MG, Sterra JJ. Obstructive uropathy
	Am Coll Surg. 2005:201:314. https://doi.org/10.1016/i.
	jamcollsurg.2004.12.026
).	Wagner AA, Arcand P, Bamberger MH. Acute renal
	failure resulting from huge inguinal bladder hernia.
	Urology. 2004;64(1):156–7. https://doi.org/10.1016/j.
0.	Bacigalupo LE, Bertolotto M, Barbiera F. Pavlica P. Lagalla
	R, Mucelli RSP, et al. Imaging of urinary bladder hernias.
	AJR Am J Roentgenol. 2005;184:546-51. https://doi.
	org/10.2214/ajr.184.2.01840546
.1.	Kratt KH, Sweeney S, Fink AS, Ritenour CW, Issa MM.
	review of the literature Can Urol Assoc 1 2008-2-619-23
	https://doi.org/10.5489/cuaj.980
2.	Karaman ZC, Saray A, Dorak C, Tamac NI. Ultrasonographic
	diagnosis of massive bladder hernia. J Clin Ultrasound.
	1993;21:534–6. https://doi.org/10.1002/jcu.1870210812

Andac N, Baltacioglu F, Tuney D, Cimsit NC, Ekinci G, Biren 13. 278 T. Inguinoscrotal bladder herniation: is CT a useful tool 279

- 280
 in diagnosis? Clin Imaging. 2002;26:347–8. https://doi.

 281
 org/10.1016/S0899-7071(02)00447-3
- 14. Izes BA, Larsen CR, Izes JK, Malone MJ. Computerized
 tomographic appearance of hernias of the bladder. J
 Urol. 1993;149(5):1002–5. https://doi.org/10.1016/
 S0022-5347(17)36280-8
 - Summary of the case

 Gadodia A, Sharma R, Parshad R. Bladder hernia: multidetector computed tomography findings. Indian J Urol. 287 2011;27:413–4.https://doi.org/10.4103/0970-1591.85453 288

1	Patient (gender, age)	Female, 40-year-old
2	Final diagnosis	Catastrophic anti-phospholipid syndrome APLS
3	Symptoms	Severe upper-right quadrant pain, nausea, and vomiting
4	Medications	Methylprednisolone, Heparin, IV immunoglobulin
5	Clinical procedure	Methylprednisolone 1.5 mg\kg and plasmapheresis commenced immediately, IV immunoglobu- lin 1 mg\kg given for 2 days, heparin infusion started with target APTT 60-70 seconds with close monitoring of blood count
6	Specialty	Radiology