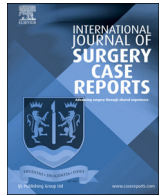




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Successful manual reduction for ureterosciatic hernia: A case report

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ABSTRACT

INTRODUCTION: Sciatic hernias are the least common type of pelvic floor hernias. The purpose of this study was to present a novel technique for manual reduction and to conduct a systematic review of previous reports of sciatic hernias to characterize them and review the outcomes.

PRESENTATION OF CASE: An 86-year-old female presented with left-sided lumbar pain. She had a past medical history of rheumatoid arthritis and was treated with prednisolone and methotrexate. Her left abdomen and left lumbar area were tender. An unenhanced abdominal computed tomography scan revealed invagination of the left ureter into the left sciatic foramen and a dilated left proximal ureter and renal pelvis. Ultrasonography showed an invaginated left ureter viewing from the left buttock. She was diagnosed with a sciatic hernia. Ultrasound-guided manual transvaginal reduction was performed. Post-procedure unenhanced abdominal computed tomography scan confirmed reduction of the ureter. After 10-months of follow-up, there is no evidence of recurrence.

DISCUSSION: Previous reports of patients with sciatic hernia were identified. Clinical data associated with the hernia, reduction technique and clinical outcomes were collected for 72 patients. Open reduction was performed in 24 patients. A ureteral stent was placed in eight patients when the hernia contained the ureter. Four postoperative complications including one death were reported in adults. There were no reports of closed manual reduction.

CONCLUSION: A sciatic hernia in women may be manually reduced without surgery. Further reviews of this rare entity are needed to determine the best management strategy.

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1. Introduction

Sciatic hernia is the rarest type of pelvic floor hernias, which includes obturator, perineal, and sciatic hernias. Sciatic hernias are characterized by the hernia contents entering the greater or lesser sciatic foramen. The greater sciatic foramen is subdivided by the piriformis muscle and atrophy of the piriformis muscle may be one cause of sciatic hernia. Sciatic hernia was first described by Papen in 1750 and observed and recorded by Verdier in 1753 [1].

The purpose of this study was to present a novel technique for manual reduction and to review published reports of sciatic hernias to summarize the experience to date in the management and outcomes of this entity. This work has been reported in line with the SCARE criteria [2].

2. Presentation of case

An 86-year-old female presented with left-sided lumbar pain. She had a past medical history of rheumatoid arthritis and was treated with prednisolone and methotrexate. On physical examination, her left abdomen and left lumbar area were tender. Laboratory examination showed no abnormalities. An unenhanced abdominal computed tomography (CT) scan revealed invagination of the left ureter into the left sciatic foramen and a dilated left proximal ureter and renal pelvis (Fig. 1). Ultrasonography showed an invaginated left ureter when the probe was placed on the left buttock (Fig. 2). The hernia orifice was 10 mm in diameter. She was diagnosed with a sciatic hernia. On the second hospital day, her symptoms continued and ultrasound-guided manual transvaginal reduction was performed. The patient was placed in the prone position in bed. The entire hand of the examiner was inserted into the vagina. Tension was put on the ureter along with nearby retroperitoneal tissue by the right index and middle finger of the examiner (Fig. 3). The ultrasound probe was placed on the left buttock of the patient. The invaginated ureter was then reduced (Fig. 4). Post-procedure unenhanced abdominal CT scan confirmed reduction of the ureter (Fig. 5). The post-reduction clinical course was uneventful, and she

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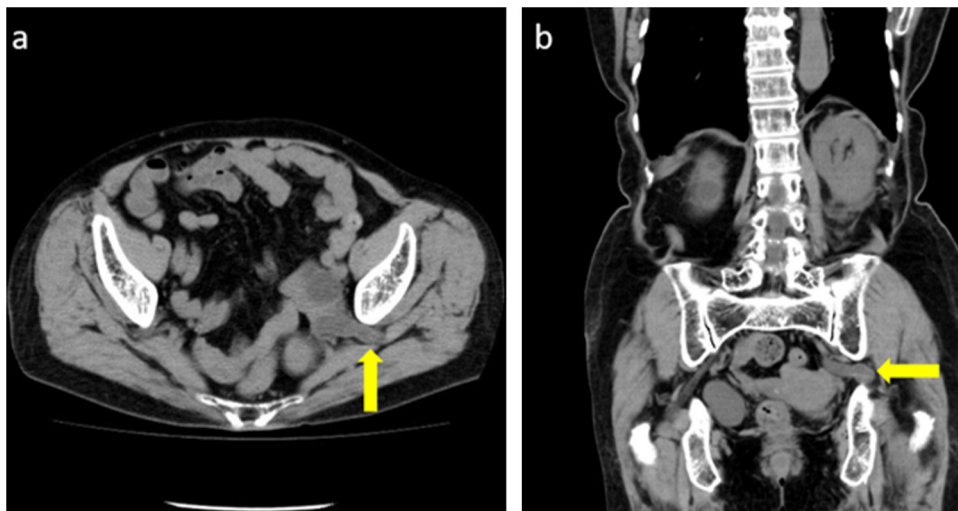


Fig. 1. Unenhanced abdominal computed tomography scan revealed invagination of the left ureter into the left sciatic foramen (arrow). **a.** axial view, **b.** coronal view.

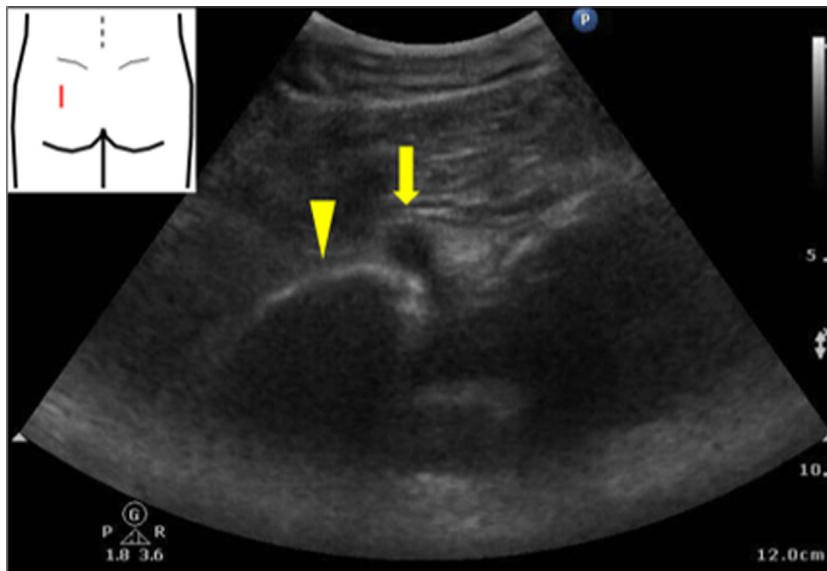


Fig. 2. Ultrasonographic imaging shows an invaginated left ureter (arrow) and the ilium (arrowhead) when the probe was placed on the left buttock.

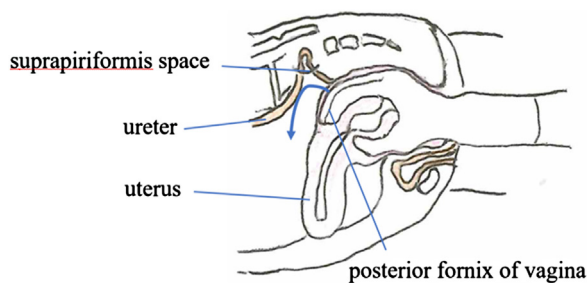


Fig. 3. Ultrasound-guided manual transvaginal reduction was performed. Tension was placed on the ureter and nearby retroperitoneum by the right index and middle finger of the operator.

was discharged one day after the procedure. After 10-months of follow-up, there is no evidence of recurrence.

3. Discussion

A search of English-language abstracts in PubMed and Igakuchuo-Zasshi through 2017, with keywords of “sciatic hernia”

or “ureterosciatic hernia” revealed a total of 71 patients with sciatic hernias [1,3–70]. Of 72 patients with a sciatic hernia including the present patient, for whom comprehensive data were found, there were 61 adults (age 29–93 years) (Table 1) and 11 children (age 2–660 days) (Table 2).

Of 61 adults including the present patient, 57 (93%) were female. Of the 11 children found in this review, five (45%) were female. This suggests that sciatic hernias tend to occur more frequently in adult females. However, there is no difference in incidence between genders in children. Atrophy of the piriformis muscle has been described as a predisposing factor. Therefore, elderly patients with decreased body mass index tend to have this condition. Common symptoms include unilateral lower abdominal pain, lumbar pain, and bulging of one buttock. In adults, the hernia contents have been reported to include the ureter (N=26), small bowel (N=14), tumors (myxoma, lipoma, osteolipoma, liposarcoma, dermoid cyst) (N=8), colon (N=2), ovary (N=2), appendix (N=1), ascites (N=1), preperitoneal fat (N=1), multiple organs (N=6).

Formerly, the diagnosis of sciatic hernia was made by physical examination (e.g. bulging) or at the time of operation. After the advent of the CT scan, it is the mainstay of diagnostic modalities to

Table 1

Reports of adult patients with a sciatic hernia.

No.	Author	Year	Age	M/F	BMI (kg/m ²)	L/R	Hernia contents	Treatment	Follow up (months)	Complications
1	Summers [1]	1921	35	M	none	R	myxoma	Observation	NA	NA
2	Lindbom [3]	1946	54	F	none	L	left ureter	open, resection of the left ureter	NA	none
3	Lawson [4]	1948	39	M	none	R	small bowel	open, reduction of small bowel	1	none
4	Beck [6]	1952	66	F	none	L	left ureter	Open	NA	heart failure
5	Kerry [9]	1964	57	F	none	L	retroperitoneal lipoma	open and gluteal incision	none	none
6	Sadek [10]	1969	33	F	none	L	small bowel	open, resection of neurofibroma, 10 days later gluteal incision	8	none
7	Rothchild [11]	1969	65	F	17.4	L	left ureter	open, lateral peritoneum was brought beneath the ureter	NA	none
8	Franken [12]	1969	58	F	none	B	bilateral ureter	open, repair	NA	none
9	Ghahremani [15]	1991	72	F	none	R	ileum	transgluteal approach	NA	none
10	Ivanov [17]	1993	60	F	none	R	cecum, appendix, small bowel and sigmoid colon	Open	5	none
11	Epner [18]	1994	86	F	none	L	left ureter	Antibiotics	NA	NA
12	Ritschel [19]	1995	51	F	13.2	L	left ureter	double J stent→ fail, open	NA	none
13	Losanoff [20]	1995	29	F	none	R	terminal ileum	transgluteal approach	4	none
14	Hayashi [21]	1995	44	F	none	L	ileum and urinary bladder	open and transgluteal approach	6	none
15	Servant [22]	1998	66	F	none	L	ileum and rectosigmoid colon	Open	NA	perforation before operation
16	Gee [24]	1999	60	F	25.0	L	left ureter	Laparoscopy	24	none
17	Noller [25]	2000	62	F	none	L	left ureter	left Gibson incision, retroperitoneal approach	NA	none
18	Yu [26]	2002	71	F	none	R	ileum	open, resection of the ileum	12	none
19	Touloupidis [27]	2006	61	F	none	R	right ureter	open, ureterolysis, reimplantation of the ureter in psoas hitch	NA	NA
20	Kohashi [28]	2006	80	F	none	R	small bowel	open	13	none
21	Dundamadappa [29]	2006	90	F	none	R	right ovary	open	NA	NA
22	Skipworth [30]	2006	36	F	none	R	liposarcoma	abdomino-perineal approach	24	none
23	Witney Smith [31]	2007	59	F	none	L	left ureter	laparoscopy	3	none
24	Loffroy [32]	2007	81	F	none	L	left ureter	open, resection of ureter, doubleJstent	3	none
25	Tsai [33]	2008	91	F	none	L	left ureter	observation	NA	none
26	Tokunaga [34]	2008	72	F	none	R	small bowel	transgluteal approach	NA	none
27	Speeg [35]	2009	82	F	none	L	left ureter	laparoscopy→open,resection of ureter	1.5	none
28	Paira [36]	2010	35	F	none	L	dermoid cyst	laparoscopy→open,resection of tumor	NA	NA

Table 1 (Continued)

No.	Author	Year	Age	M/F	BMI (kg/m ²)	L/R	Hernia contents	Treatment	Follow up (months)	Complications
29	Clemens [37]	2010	80	F	none	L	left ureter	double J stent	NA	none
30	Chitranjan [38]	2010	55	F	none	L	sigmoid colon	NA	NA	NA
31	Bernard [39]	2010	72	F	none	R	small bowel, right ovary	laparoscopy	12	none
32	Singh [40]	2011	79	F	none	R	preperitoneal fat	robot	NA	none
33	Rather [41]	2011	80	F	none	L	small bowel	open	7	none
34	Sugimoto [42]	2011	76	F	none	L	left ureter	stent	3	none
35	Lopez [43]	2012	50	F	none	R	lipoma	transgluteal approach, resection	6	none
36	Andraus [44]	2012	64	F	none	L	ascites	NA	none	death
37	Whybum [45]	2013	74	F	none	B	bilateral ureter	laparoscopy	NA	NA
38	Labib [46]	2013	80	F	none	R	colon	observation	NA	NA
39	Pimenta [48]	2014	55	F	none	L	lipoma	transgluteal approach	24	none
40	Tsuzaka [49]	2014	78	F	14.5	L	left ureter	laparoscopy	8	none
41	Kato [50]	2014	72	F	none	L	left ureter	stent	72	recurrence after stent removal
42	Duran [51]	2015	39	F	none	L	osteolipoma	surgery (no data in detail)	NA	NA
43	Salari [52]	2015	87	F	14.4	R	right ureter	stent	12	none
44	Yanagi [53]	2015	92	F	none	L	left ureter	stent	12	none
45	Duiskas [54]	2015	53	M	29.0	R	lipoma	open, resection	NA	none
46	Colombo [56]	2016	65	F	21.0	R	right ovary, adnexa	laparoscopy	3	none
47	Regelman [57]	2016	60	F	none	L	left ureter	robotic, ureterolysis	6	none
48	Demetriou [58]	2016	76	F	none	L	left ureter	observation	6	none
49	Imamura [59]	2006	83	F	14.0	R	ileum	open	1	pneumonia
50	Uchida [60]	2010	75	F	14.1	R	ileum	observation	15	none
51	Tanaka [61]	2011	84	F	12.4	R	appendix	open, ileocectomy	6	anastomotic leakage
52	Ema [62]	2011	75	F	16.4	L	ileum	open, ileocectomy	20	none
53	Eriguchi [63]	2012	74	M	17.2	L	left ureter	DJ stent	NA	none
54	Asanuma [64]	2012	83	F	19.6	R	small bowel	open	7	none
55	Tsutsui [65]	2014	76	F	21.2	L	left ureter	DJ stent	6	none
56	Taguchi [66]	2014	84	F	22.9	R	right ovary	lap, resection of right ovary and right adnexa uteri	12	none
57	Iida [67]	2015	60	F	17.1	R	right ovary and right fimbriae of uterine tube	lap, patch closure	12	none
58	Kise [68]	2016	36	F	17.5	L	left ureter	DJstent	12	none
59	Nitta [69]	2016	93	F	19.2	R	small bowel	open, resection of paro-ovarian cyst	NA	recurrence
60	Ishikawa [70]	2017	77	F	23.2	R	small bowel	lap, mesh plug and patch	12	none
61	Our patient	2018	86	F	20.9	L	left ureter	manual reduction	10	none

NA=not applicable, BMI = body mass index, L=Left, R=Right, M=Male, F=Female.

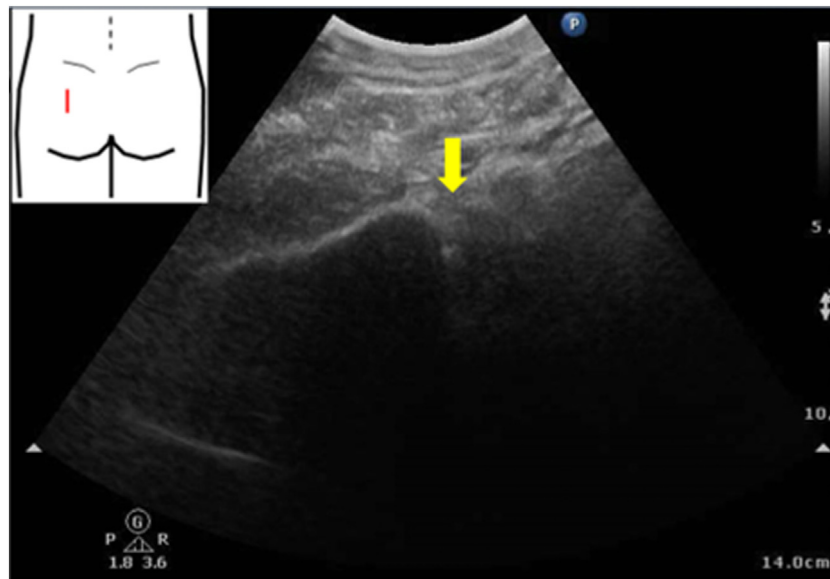


Fig. 4. The ultrasound probe was placed on the left buttock of the patient during the procedure and the invaginated ureter was reduced (arrow).

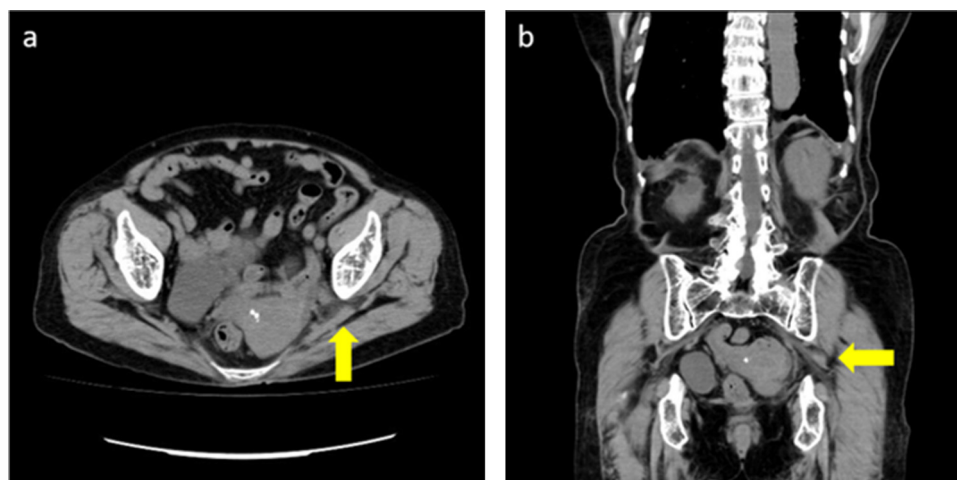


Fig. 5. Post-procedure unenhanced abdominal computed tomography scan confirmed reduction of the left ureter (arrow). **a.** axial view, **b.** coronal view.

Table 2

Reports of child patients with a sciatic hernia.

No.	Author	Year	Age (days)	M/F	BMI(kg/m ²)	L/R	Contents	Treatment	Follow-up (m)	Complications
1	Henegar [5]	1952	660	M	none	R	cecum and right ureter	right gluteal incision	6	hypertrophy of the scar
2	Gaffney [7]	1958	150	F	none	L	none	left gluteal incision	12	none
3	Chamberlain [8]	1958	2	F	none	L	retroperitoneal teratoma	open, resection of the tumor	none	death due to bronchopneumonia
4	Franken [12]	1969	60	M	none	B	bilateral ureter	none	NA	NA
5	Franken [12]	1969	35	F	none	L	rectosigmoid	none, spontaneous recovery	NA	NA
6	Bohnert [13]	1971	60	M	none	B	bilateral ureter	none	12	Urinary Tract Infection
7	Lebowitz [14]	1973	45	F	none	R	right ureter	none	NA	NA
8	Attar [16]	1992	540	M	none	R	sigmoid colon	right gluteal incision	NA	NA
9	Arat [23]	1998	90	F	none	L	left ureter	NA	NA	NA
10	Seifarth [47]	2014	49	M	none	R	ileum	laparoscopy→open	36	none
11	Nosek [55]	2015	1	M	none	R	duplication of rectum	laparoscopy→transgluteal, endorectal pull through	24	none

NA=not applicable, BMI=Body mass index, L=left, R=right, M=Male, F=Female.

identify a sciatic hernia. Intravenous pyelogram or retrograde pyelogram have been performed for some patients with ureterosciatic hernias. The “curlicue” sign of the ureter was specific for this entity if the hernia contains the ureter [6].

The treatment of a patient with a sciatic hernia depends on the hernia contents and commonly includes surgery (usually, open repair or transgluteal repair) or placement of a ureteral stent if the ureter is involved. Open reduction with laparotomy was performed in 24 patients in the series reviewed. Recently, nine patients were reportedly treated laparoscopically and two by robotic-assisted surgery. Two patients underwent conversion from laparoscopy to laparotomy. There are no reports of successful transvaginal closed manual reduction.

Transvaginal closed manual reduction was used to treat the present patient. With the patient in the prone position, the assistant places the ultrasound probe on the left buttock. The exact location of the hernia was confirmed by the CT scan. After confirming the location of the hernia, the operator inserted the right hand into the vagina, while extending the index and middle fingers (Fig. 3). The entire hand of the examiner should be inserted into the vagina. The index and middle fingers were positioned at the posterior fornix of the vagina, and traction applied with the fingertips in a repetitive manner, reducing the invaginated left ureter. The ureter was reduced along with adjacent connective tissue. After that, the operator and assistant confirmed reduction with ultrasound imaging.

In the combined series of 72 patients, postoperative complications include one death from sepsis, one anastomotic leak, one patient developed heart failure, one patient developed pneumonia, and two recurrences occurred in adults. In children, there was one death from bronchopneumonia. Two recurrences are reported after a repair without using mesh (1/20) and after removal of the ureteral stent (1/3). There are deaths reported after operative repair.

Transvaginal manual reduction is less invasive and easier than other reported approaches. If there are no suspicion of strangulation of the invaginated tissue, it may be considered as the first modality to be used. However, there is a possibility of recurrence because the hernia defect has not been definitively closed. In addition, this maneuver is not applicable to men, children (female children have an intact hymen and small vagina), and possibly, young females whose vagina may not be able to accommodate the examiner's hand.

4. Conclusion

An incarcerated sciatic hernia in women can be manually reduced. To determine the best management strategy, further studies and collection of data regarding this rare entity, treatment and follow-up are necessary.

Conflicts of interest

All authors have no conflict of interest.

Sources of funding

Authors had no sources of funding.

Ethical approval

IRB/Ethics Committee ruled that approval was not required for this study.

Consent

Written informed consent was obtained from the patients for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

The work presented was carried out in collaboration between all authors. JK, KY, TS, AKL, and TK defined the research theme, discussed analyses and approved the final version to be published. JK analyzed the data, interpreted the results and wrote the paper.

Registration of research studies

There is no need to register because it is a case report.

Guarantor

Jiro Kimura.

Provenance and peer review

Not commissioned, externally peer-reviewed.

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