Successful manual reduction for ureterosciatic hernia: A case report

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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 buttck. 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.

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 the...
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/m²) | 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   | Gahremani [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, double Jeantten                                | 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            |
| No. | Author          | Year | Age | M/F | BMI (kg/m²) | 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  | Chitraranjan    | 2010 | 55  | F   | none        | L   | left ureter              | sigmoid colon              | 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                   | NA                                |
| 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  | Whyburn [45]    | 2013 | 74  | F   | none        | B   | bilateral ureter         | laparoscopy                | NA                   | NA                                |
| 38  | Labib [46]      | 2013 | 50  | 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  | Dułskas [54]    | 2015 | 53  | M   | 29.0        | R   | lipoma                   | open, resection            | NA                   | NA                                |
| 46  | Colombo [55]    | 2016 | 65  | F   | 21.0        | R   | right ovary, adnexas     | 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, ileoceccoty          | 6                    | anastomotic leakage               |
| 52  | Ema [62]        | 2011 | 75  | F   | 16.4        | L   | ileum                    | open, ileoceccoty          | 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  | Toguchi [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 fimbria of uterine tube | lap, patch closure | 12 | none |
| 58  | Kise [68]       | 2016 | 36  | F   | 17.5        | L   | left ureter              | DJ stent                   | 12                   | none                              |
| 59  | Niitta [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/m²) | 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, death due to bronchopneumonia    |
| 3   | Chamberlain [8] | 1958 | 2          | F   | none        | L   | retroperitoneal teratoma  | left gluteal incision open, resection of the tumor | none          | NA                                     |
| 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 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            | NA                                     |
| 11  | Nosek [55] | 2015 | 1          | M   | none        | R   | duplication of rectum     | laparoscopy → transgluteal, endorectal pull through | 24            | none                                   |

*M* = not applicable, BMI = Body mass index, L = left, R = right, M = Male, F = Female.
identify a sciatric hernia. Intravenous pyelogram or retrograde pyelogram have been performed for some patients with ureteroscatic 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 sciatric hernia depends on the hernia contents and commonly includes surgery (usually, open repair or transluteal 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 sciatric 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.

References

[1] J.E. Summers, Sciatric hernia: report of a case complicated with myxomatous tumor of the scrotum, Ann. Surg. 75 (June (6)) (1922) 672–676.
[2] R.A. Agha, M.R. Borrelli, R. Farwana, K. Koshy, A. Fowler, D.P. Orgill, For the SCARE Group, The SCARE 2018 statement: updating consensus Surgical Case Report (SCARE) guidelines, Int. J. Surg. 60 (2018) 132–136.
[3] A. Lindblom, Unusual ureteral obstruction by herniation of ureter into sciatric foramen, Acta Radiol. 28 (June (3)) (1947) 225.
[4] R. Lawson, Sciatric hernia, Can. Med. Assoc. J. 59 (September (3)) (1948) 265–267.
[5] G.C. Henegar, C.B. Hudson, G.L. Jensen, Sciatric notch hernia: report of a case and description of a new operative approach, AMA Arch. Surg. 64 (March (3)) (1952) 389–400.
[6] W.C. Beck, W. Baursys, J. Brochu, W.A. Morton, Herniation of the ureter into the sciatric foramen (“curlicue ureter”), J. Am. Med. Assoc. 149 (May (5)) (1952) 441–442.
[7] L.B. Caffney, J.F. Schanno, Sciatric hernia; a case of congenital occurrence, Am. J. Surg. 95 (June (6)) (1958) 974–975.
[8] W.H. Chamberlain, D.S. Motsay, A.C. Barone, An unusual sciatric hernia in a deceitful masquerade, Guthrie Clin. Bull. 27 (April (4)) (1958) 156–164.
[9] R.L. Kerr, R.L. Tygart, W.W. Glas, Lipoma: a “reversed” perineal sciatric hernia, Am. J. Surg. 107 (June) (1964) 883–884.
[10] H.M. Sadek, D.R. Kiss, E. Vasconcelos, Sciatric hernia caused by a neurofibroma. Surgical repair with a stainless wire mesh, Int. Surg. 54 (August (2)) (1970) 135–141.
[11] T.P. Rothchild, Ureteral hernia. Report of a case of herniation of the ureter into the sciatric foramen, Arch. Surg. 98 (January (1)) (1969) 96–98.
[12] E.A. Franken Jr, E.E. Smith, Sciatric hernia: report of three cases including two with bilateral ureteral involvement, Am. J. Roentgenol. Radium Ther. Nucl. Med. 107 (December (4)) (1969) 791–795.
[13] W.W. Bohnert, Ureteral sciatric hernias: case report of an infant with bilateral ureteral herniation into the sciatric foramina, J. Urol. 106 (July (1)) (1971) 142–143.
[14] R.L. Lebowitz, Ureteral sciatric hernia, Pediatr. Radiol. 1 (October (3)) (1973) 178–182.
[15] G.G. Grahameani, A.S. Michael, Sciatric hernia with incarcerated ileum: CT and radiographic diagnosis, Gastrointest. Radiol. 16 (Spring (2)) (1991) 120–122.
[16] M. Attal, J.A. Jibouil, A. Yakoub, G.D. Kayali, P.T. Mimadou, Congenital sciatric hernia, J. Pediatr. Surg. 27 (December (12)) (1992) 1603–1604.
[17] N.T. Ivanov, J.E. Losanoff, K.T. Kjossev, Recurrent sciatric hernia treated by prosthetic mesh reinforcement of the pelvic floor, Br. J. Surg. 81 (March (3)) (1994) 447.
[18] S.L. Egner, E.M. Lautin, Case report: intermittent sciatric herniation of the ureter, Clin. Radiol. 49 (November (11)) (1994) 832–833.
[19] S. Ritschel, D. Heinbach, G. Schoenich, Ureteroscatic hernia, Scand. J. Urol. Nephrol. 30 (October (5)) (1996) 423–424.
[20] J. Losanoff, K. Kjossev, Sciatric hernia, Acta Chir. Belg. 95 (November–December (6)) (1995) 269–270.
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