Clinical, Surgical Characteristics and Long-Term Outcomes of Lumbar Hernia.

Chaoyong Shen

Sichuan University West China Hospital

Guixiang Zhang

Sichuan University West China Hospital

Sen Zhang

Chengdu Second People's Hospital

Yuan Yin

Sichuan University West China Hospital

Bo Zhang (✉ hxcwk@126.com)

Sichuan University West China Hospital

Yinghan Song

Sichuan University West China Hospital

Wenzhang Lei

Sichuan University West China Hospital

Research article

Keywords: Lumbar hernia, mesh repair, surgery, anaesthesia

Posted Date: November 23rd, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-107783/v1>

License: This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background/Aim

Lumbar hernia is extremely rare which resulting from a defect in the abdominal wall. Due to its rarity, there is no established optimal treatment available for lumbar hernia yet. Thus, we here investigated the clinical, surgical characteristics and outcomes of lumbar hernia by collecting 28 such patients in our hospital.

Methods

Patients diagnosed with lumbar hernia from our institution between April 2011 and August 2020 were retrospectively collected in this study. Demographics, clinical characteristics and surgical information were recorded.

Results

A consecutive series of 28 patients with lumbar hernia were retrospectively collected, including 13 males (46.4%) and 15 females (53.6%). The ages of the patients ranged from 5 to 79 years (median: 55 years), with a mean age of 55.6 ± 14.9 years. A total of 7 cases had a history of previous lumbar trauma or surgery. There were 11 (39.3%), 15 (53.6%) and 2 (7.1%) cases had right, left and bilateral lumbar hernia, respectively. Superior and inferior lumbar hernia were found in 25 (89.3%) and 3 (10.7%) patients. General anesthesia was applied in 16 cases (group A), whereas 12 patients received local anesthesia (group B). Patients in the group B had a shorter hospital stay than that of the group A (3.5 ± 1.3 days vs. 7.1 ± 3.2 days, $p=0.001$), as well as total hospitalization expenses between the two groups (8309.3 ± 1467.1 CNY vs. 19117.3 ± 8116.1 CNY, $p<0.001$).

Conclusions

Lumbar hernia is a relatively rare entity, and inferior lumbar hernia is rarer. It is feasible to repair lumbar hernia under local anesthesia, and it may be more suitable than general anesthesia in some selected cases.

Introduction

The lumbar hernia, is defined as the protrusion of an organ (either intraperitoneal or extraperitoneal) or extraperitoneal contents through a defect in the posterolateral abdominal wall [1], which was first proposed in 1672 by Barbette and the first true case was published by deGarangeor in 1731 [2, 3]. The lumbar region is surgically defined as space between the twelfth rib superiorly, the iliac crest inferiorly, the erector spinae medially, and the external oblique laterally; anatomically, lumbar hernias can be categorised as superior (Grynfeltt-Lesshaft triangle) and inferior (Petit triangle) lumbar hernia [4]. Due to the clinical manifestations are asymptomatic and vague, the diagnosis of lumbar hernia is difficult and is usually not suspected initially. Low suspicion may lead to delayed diagnosis or misdiagnosis of other

soft tissue lesions, such as subcutaneous lipoma, retroperitoneal tumor, abscesses, fibromas or perirenal abscess [5, 6]. Surgical treatment of lumbar hernias is essential because of risks of incarceration, strangulation and perforation [7–9], but surgical repair can be difficult considering the location of the hernia and the surrounding bony structures [1, 10].

Previously, with only a few hundred of patients reported, lumbar hernias are extremely rare [9, 11]. A hernia surgeon may only come across one case throughout their career in view of the rarity of lumbar hernia [11]. Up to now, there is little information about the clinical features, surgical treatment and postoperative follow-up of lumbar hernia. There is still ongoing discussion regarding which is the optimal surgical technique to be employed for lumbar hernias [9]. In the present study, we, therefore, investigated the clinical features, treatments, and long-term follow-up outcomes of lumbar hernias based on data obtained from 28 consecutive patients in our institution.

Materials And Methods

Patients Selection

All patients diagnosed with lumbar hernia from our institution between April 2011 and August 2020 were retrospectively recruited in this study. Patients with incomplete medical records or without operation were excluded. Abdominal computed tomography and/or ultrasonography were routinely performed preoperatively for each patient. All data were obtained from the electronic medical chart, including patient's age, gender, side of hernia, previous history of lumbar surgery or trauma, anesthesia methods, body mass index (BMI), operation-related information, total hospitalization expenses (Chinese Yuan, CNY) and co-morbidity, etc. Operation consents were obtained from each patient in this cohort. This study was approved by the Institutional Review Board of West China Hospital and was carried out in accordance with the declaration of Helsinki.

Anaesthetic and Surgical Procedure

General or local infiltration anesthesia was used for tension-free lumbar hernia mesh repair in this study. No sedation or analgesia was preoperatively used as premedication for those who under local infiltration anaesthesia. The local anesthetics solutions were comprised of 20 ml of 2% lidocaine, 10 ml of 1% ropivacaine and 2 ml of 0.1% epinephrine, and adding normal saline to the total amount of 160 ml. Finally, the concentration of lidocaine and ropivacaine was 0.25% and 0.06% respectively. Stepwise infiltration anaesthesia was performed using a 10-ml syringe and a 22-gauge needle. In general, 40–50 ml were injected for unilateral lumbar hernia. Figure 1 shows a patient undergoing lumbar hernia repair under local anesthesia. The patients under general anesthesia were given the following drugs: inhalation anesthetics, propofol, sufentanil, atracurium, penethyclidine, midazolam, analgesics and antiemetics. After anesthesia, a transverse incision in the waist was made according to the location and size of hernia sac. Stepwise subcutaneous dissection and blunt dissociation of muscles (cut off some muscles if necessary) were used to expose the hernia sac. And then, the hernia sac was dissected from its surroundings and reduced. A pre-peritoneal plane was created with blunt swab dissection. Of note,

some patients with large abdominal wall defect, transabdominal surgical approach was performed. In the present study, mesh repairs were made using the ULTRAPRO™ Hernia System (UHS), ULTRAPRO™ PLUG (UPP) and PROCEED™ Surgical Mesh (PROCEED) according to the size of abdominal wall defect and location. After the mesh was placed and fixed appropriately, the edges of the defect were sutured using interrupted 2 – 0 prolene or vicryl. And then, the wound was closed. The drainage tube was not placed routinely unless the wound was large.

Follow-up and Statistical Analysis

All patients were followed up by telephone calls and outpatient clinic visits, and the last follow-up time was September 2020. Calculations statistical analysis was performed with the Statistical Package for the Social Science (SPSS) version 21.0 for Windows (SPSS Inc, Chicago, IL, USA). Continuous variables were expressed as mean $\pm$ standard deviation or median (range). Measurement data was analyzed by variance analysis. Categorical were described as frequencies and percentage, and compared with Chi-square or Fisher's exact test. All *p* values were two-sided, with *p* < 0.05 indicated statistically significant.

Results

Patient and Clinical Characteristics

Until August 2020, a consecutive series of 28 patients with lumbar hernia in our institution were retrospectively collected, including 13 males (46.4%) and 15 females (53.6%), with the male-to-female ratio of 0.87 (Table 1). The ages of the patients ranged from 5 to 79 years (median: 55 years), with a mean age of 55.6 ± 14.9 years. Almost all patients presented with a history of a painless mass in the lumbar region. A total of 7 cases had a previous history of lumbar trauma (one case) or surgery. Only 1 five-year-old patient had congenital lumbar hernia, while the remaining patients (27 cases) had acquired lumbar hernia; of the 27 patients, 20 (71.4%) cases were primary, while a total of 7 (25.0) patients were secondary. There were 11 (39.3%), 15 (53.6%) and 2 (7.1%) cases had right, left and bilateral lumbar hernia for the entire cohort, respectively. Superior and inferior lumbar hernia were found in 25 (89.3%) and 3 (10.7%) patients; the four hernia sacs of 2 patients with bilateral lumbar hernia all protruded through the superior lumbar triangles. Moreover, two abdominal wall defects were intraoperatively observed in 1 patient with unilateral lumbar hernia. Protrusion of intraperitoneal content (colon) was observed in 2 cases, but no incarceration or strangulation was found (Fig. 2). Moreover, 2 patients were complicated with inguinal hernia, one of which was bilateral inguinal hernia. There were 16 and 12 patients underwent general and local anesthesia respectively.

Table 1
Demographic and Clinical Characteristics of Lumbar Hernia (n = 28)

Parameters	N (%)
Gender	
Male	13 (46.4)
Female	15 (53.6)
Age (yr: median [range])	55 (5 ~ 79)
Previous lumbar trauma or surgery	7 (25.0)
BMI (kg/m ² , mean ± SD)	23.0 ± 3.4
Congenital/acquired lumbar hernia	1 (3.6)/27 (96.4)
History of COPD	2 (7.1)
Side of lumbar hernia	
Right	11 (39.3)
Left	15 (53.6)
Bilateral	2 (7.1)
Superior/inferior lumbar hernia	25 (89.3)/3 (10.7)
Co-morbidity [‡]	
Present	8 (28.6)
Absent	20 (71.4)
Combined with inguinal hernia	2 (7.1)
Size of abdominal wall defect (cm, mean ± SD)	3.2 ± 1.84
Anesthesia method	
General	16 (57.1)
Local	12 (42.9)
Hospital stay (days, mean ± SD)	5.5 ± 3.1
BMI, body mass Index; SD, standard deviation; COPD, chronic obstructive pulmonary disease; ‡includes diabetes mellitus, chronic cardiovascular disease and liver cirrhosis.	

Surgical Outcomes

All patients underwent classical open repair. General anesthesia was applied in 16 cases (group A), whereas 12 patients received local anesthesia (group B). A total of 27 patients underwent mesh repair, and primary closure was performed in one case with congenital lumbar hernia. Totally, 25 cases underwent extraperitoneal repair. No patient in the group B required conversion to general or spinal anaesthesia. There were no significant between-group differences in gender, age, BMI, and side of lumbar hernia ($p > 0.05$). Though a trend for smaller size of abdominal wall defect and shorter operation time were observed in the group B when compared with group A, the differences were not significant ($p > 0.05$). No postoperative bleeding and infection occurred. Of note, patients in the group B had a shorter hospital stay than that of group A (3.5 ± 1.3 days vs. 7.1 ± 3.2 days, $p = 0.001$), as well as total hospitalization expenses between the two groups (8309.3 ± 1467.1 CNY vs. 19117.3 ± 8116.1 CNY, $p < 0.001$). With a median follow-up duration of 45.9 months (range: 1 ~ 113 months), a total of 1 patient experienced recurrence of lumbar hernia in the group A. In addition, there was no significant difference with respect to chronic wound pain and foreign body sensation between the two groups during the follow-up period (Table 2).

Table 2
Comparison of Clinical Features and Operation-related Information between General (n = 16) and Local (n = 12) anesthesia

	group A	group B	<i>P</i>
Gender (%)			0.229
Male	9 (56.3)	4 (33.3)	
Female	7 (43.7)	8 (66.7)	
Age (years)	55.4 ± 18.1	56.0 ± 9.7	0.915
BMI (kg/m ²)	23.8 ± 4.0	22.0 ± 2.4	0.178
Side of lumbar hernia (%)			0.107
Right	8 (50.0)	3 (25.0)	
Left	6 (37.5)	9 (75.0)	
Bilateral	2 (12.5)	0 (0.0)	
Size of abdominal wall defect (cm)	3.8 ± 2.1	2.5 ± 1.2	0.069
Operation time (min)	40.0 ± 14.3	34.1 ± 5.4	0.185
Postoperative bleeding (Y/N)	0/16	0/12	-
Wound infection (Y/N)	0/16	0/12	-
Chronic wound pain (Y/N)	2/14	1/11	1.000
Foreign body sensation (Y/N)	3/13	2/9	1.000
Postoperative recurrence (Y/N)	1/15	0/12	1.000
Hospital stay (days)	7.1 ± 3.2	3.5 ± 1.3	0.001
Total hospitalization expenses (CNY)	19117.3 ± 8116.1	8309.3 ± 1467.1	< 0.001
BMI, body mass Index; Y, yes; N, no; CNY, Chinese Yuan.			

Discussion

Lumbar hernias can be classified based on location and etiology [1]. According to the anatomical location of the defect, lumbar hernias were divided into Grynfeltt hernia (the superior triangle) and Petit hernia (the inferior triangle). However, blunt abdominal trauma may create lumbar hernia, which was classified as the “diffuse” type and was not be confined to these two triangles [12, 13]. The superior lumbar triangle is an inverted triangle whose base is formed by the 12th rib and the serratus posterior inferior muscle, while the inferior lumbar triangle is an upright triangle whose base is formed by the iliac crests. The literature suggests that lumbar hernias occur most commonly through the superior lumbar

triangle [10, 14]. Superior and inferior lumbar hernia were found in 25 (89.3%) and 3 (10.7%) patients in the present study, which is consistent with their reports. Moreover, lumbar hernias can be divided into 2 categories: congenital or acquired. In all, approximately 20% of lumbar hernias are congenital [1], and acquired lumbar hernias account for 80% of lumbar hernias [13]. Congenital lumbar hernias are those that appear during infancy, and may be associated with musculoskeletal or other birth defects [10, 15–17]. Acquired lumbar hernias can be further classified as either primary or secondary. The former type (spontaneous) is precipitated by conditions associated with increased intra-abdominal pressure or aging, chronic bronchitis, and extreme thinness, etc. Secondary-type lumbar hernias, are often associated with surgical incisions, trauma, or lumbar abscess, which are estimated to represent 25% of lumbar hernias [1, 18]. Consistent with previous reports, our study also found that some patients had a history of lumbar trauma, surgery, or combined with chronic bronchitis.

The diagnosis of lumbar hernia is often difficult and is not suspected initially. Firstly, clinical presentation for lumbar hernias is asymptomatic or variable. Patients may present with flank pain, back or abdominal discomfort and painless mass. In addition, the challenge in diagnosis also stems from a lack of awareness and insufficient cases. Physical examination may reveal a reducible mass that may increase in size with coughing and Valsalva maneuver [5]. A reducible mass with cough impulse, however, may not always be present due to small defects, obesity or other factors. Computed tomography (CT) is exceedingly useful in the diagnosis of lumbar hernias as it can delineate the location and size of the defect, as well as delineate the muscular and fascial layers and the contents within the hernia sac, so as to provide the basis for making a reasonable treatment plan [19, 20]. Previous study has shown that abdominal CT scanning was used in 56 of 66 instances and was 98% sensitive for diagnosis of traumatic lumbar hernias [13]. Moreover, CT can also effectively rule out the other differential diagnoses of lumbar hernias, such as lipomas, abscesses, and retroperitoneal tumors [10, 18].

Lumbar hernias are more often found on the left side and in the upper lumbar triangle [21]. In the present study, we also found that a majority of lumbar hernias located in the left and the superior triangle. There were 2 (7.1%) patients having coexisting inguinal hernia in this study, which was lower than that reported in the literature [8]. Moreover, bilateral lumbar hernias are even less frequently documented, and most of the reports are case reports so far [22, 23]. Our results show that there were 2 patients with bilateral lumbar hernia who underwent surgery under general anesthesia, and all hernia sacs protruded through the superior lumbar triangles. The contents of lumbar hernia may be extraperitoneal or intraperitoneal, such as extraperitoneal fat, colon, spleen, liver etc.; whereas, in the traumatic lumbar hernia, fat (42%), colon (41%), and small bowel (32%) were the most common hernia contents [13].

Most lumbar hernias have a propensity to undergo slow benign expansion in size over time. Once the defect increases, the difficulty of subsequent surgery will be increased accordingly [24]. Additionally, the reported risk of incarceration from lumbar hernias is about 25-30.8% [1, 21] and there was an 8% chance of strangulation [25]. Therefore, it is recommended that these hernias should not be managed conservatively without surgery [17, 24]. Surgical repair to eliminate the defect, reconstruct and strengthen the abdominal wall may be the most effective treatment for lumbar hernias. Hence, surgical treatment

with either open or laparoscopic is both the treatment of choice. Recently, successful laparoscopic repairs of lumbar hernia defects have been reported [26]. In laparoscopic repair, the main advantage is that it seems to ensure the proper placement of mesh, and also it has been shown to be more favorable surgical outcomes (shorter operating time and shorter hospital stay, etc.) than open repair. However, open repair is the most commonly used technique for lumbar hernias currently [6]. In the present study, all patients underwent open surgery. The hernia can be repaired through a transabdominal or extraperitoneal approach. Generally, repair technique largely depend on the size of hernia and available facilities. Primary closure with interrupted tension-free sutures for lumbodorsal fascia has the potential to be effective in small hernias, but sometimes the failure rate is also high [13]. For large hernias, they can be repaired by using non-absorbable prosthetic material [1, 10]. In this study, a total of 27 patients underwent mesh repair, and primary closure was performed in one case with congenital lumbar hernia. On the whole, with limited cases to compare surgical approaches and surgical techniques, the ideal surgical treatment is inconclusive yet.

Currently, there is no relevant study to explore the feasibility and safety in the treatment of lumbar hernia under local anesthesia. In the present study, the hospital stays of the local anesthesia are significantly less when compared to the general anesthesia, as well as the total hospitalization expenses. However, further explorations using a large sample are warranted. The long-term follow-up and recurrence data are scanty. van Steensel et al. reported that the 2.0% had a recurrence after surgical repair for primary lumbar hernia [21]. However, they have pointed out that an underestimation of the recurrence rates may be occurred due to publication bias. By comparison, the recurrence rate was 1 out of 28 patients in this study (3.6%), which is higher than that of their data. Predictors associated with an increased likelihood for recurrence of lumbar hernias are those with diffuse ones and a defect size larger than 16 cm [26].

Conclusions

In summary, lumbar hernia is a relatively rare entity, and inferior lumbar hernia is rarer. There are currently no guidelines for the ideal method of repair. It is feasible to repair lumbar hernia under local anesthesia, and it may be more suitable than general anesthesia in some selected cases.

Abbreviations

BMI: body mass Index; SD, standard deviation; COPD, chronic obstructive pulmonary disease; CNY: Chinese Yuan; CT: Computed tomography.

Declarations

Ethics approval and consent to participate

This study was approved by the Institutional Review Board of West China Hospital. Consents were obtained from each patient in this cohort.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Funding

Not applicable.

Availability of data and materials

The data will not be made available in order to protect the participant's identity. Those interested parties can contact Prof. Zhang (hxwcwk@126.com) who will provide the whole raw data.

Author's contributions

ZB, SYH and LWZ conceived or designed the study. SCY, ZGX, ZS and YY acquired, analyzed, or interpreted the data. SCY, ZGX and ZS drafted the manuscript. ZB, SYH and LWZ critically revised the manuscript for important intellectual content. SCY and ZGX performed the statistical analysis. All authors have given the final approval of the manuscript for submission and publication.

Acknowledgements

The authors gratefully acknowledge the whole staff of the Department of Gastrointestinal Surgery, West China Hospital, who generously provided assistance in the collection of data throughout the duration of the study. In addition, we would like to thank Dr. Hare Ram Karn very much for his kind assistance with the English language.

References

1. Stamatiou D, Skandalakis JE, Skandalakis LJ, Mirilas P. Lumbar hernia: surgical anatomy, embryology, and technique of repair. *Am Surg*. 2009; 75(3): 202-207.
2. Barbette P. Opera chirurgico-anatomica. Lugduni J a Gelder. 1672: 26.
3. deGarangeor RJC. Traie des operations de chirurgie. 1731; 1: 369.
4. Macchi V, Porzionato A, Morra A, et al. The triangles of Grynfeltt and Petit and the lumbar tunnel: an anatomo-radiologic study. *Hernia*. 2017; 21(3): 369-376.
5. Ahmed ST, Ranjan R, Saha SB, Singh B. Lumbar hernia: a diagnostic dilemma. *BMJ Case Rep*. 2014; 2014: bcr2013202085.
6. Kadler B, Shetye A, Patten DK, Al-Nowfal A. A primary inferior lumbar hernia misdiagnosed as a lipoma. *Ann R Coll Surg Engl*. 2019; 101(4): e96-e98.

7. Pang RR, Makowski AL. Inferior lumbar triangle hernia with incarceration. *Am J Emerg Med.* 2019; 37(6): 1218.e5-1218.e6.
8. Fokou M, Fotso P, Ngowe Ngowe M, Essomba A, Sosso M. Strangulated or incarcerated spontaneous lumbar hernia as exceptional cause of intestinal obstruction: case report and review of the literature. *World J Emerg Surg.* 2014; 9: 44.
9. van Steensel S, Bloemen A, van den Hil LCL, van den Bos J, Kleinrensink GJ, Bouvy ND. Pitfalls and clinical recommendations for the primary lumbar hernia based on a systematic review of the literature. *Hernia.* 2019; 23(1): 107-117.
10. Beffa LR, Margiotta AL, Carbonell AM. Flank and Lumbar Hernia Repair. *Surg Clin North Am.* 2018; 98(3): 593-605.
11. Ploneda-Valencia CF, Cordero-Estrada E, Castañeda-González LG, et al. Grynfelt-Lesshaft hernia a case report and review of the literature. *Ann Med Surg (Lond).* 2016; 7: 104-106.
12. Balkan M, Kozak O, Güleç B, Tasar M, Pekcan M. Traumatic lumbar hernia due to seat belt injury: case report. *J Trauma.* 1999; 47(1): 154-155.
13. Burt BM, Afifi HY, Wantz GE, Barie PS. Traumatic lumbar hernia: report of cases and comprehensive review of the literature. *J Trauma.* 2004; 57(6): 1361-1370.
14. Ploneda-Valencia CF, Cordero-Estrada E, Castañeda-González LG, Sainz-Escarrega VH, Varela-Muñoz O, De la Cerda-Trujillo LF, Bautista-López CA, López-Lizarraga CR. Grynfelt-Lesshaft hernia a case report and review of the literature. *Ann Med Surg (Lond).* 2016; 7: 104-106.
15. Karmani S, Ember T, Davenport R. Congenital lumbar hernias: A case report. *J Pediatr Surg.* 2002; 37(6): 921-922.
16. Somuncu S, Bernay F, Rizalar R, et al. Congenital lumbar hernia associated with the lumbocostovertebral syndrome: two cases. *Eur J Pediatr Surg.* 1997; 7(02): 122-124.
17. Sharma A, Pandey A, Rawat J, et al. Congenital lumbar hernia: 20 years' single centre experience. *J Pediatr Child H.* 2012; 48(11): 1001-1003.
18. Moreno-Egea A, Baena EG, Calle MC, Martinez JA, Albasini JL. Controversies in the current management of lumbar hernias. *Arch Surg.* 2007; 142: 82–88.
19. Baker M, Weinerth J, Andriani R, et al. Lumbar hernia: diagnosis by CT. *Am J Roentgenol.* 1987; 148(3): 565-567.
20. Martín J, Mellado JM, Solanas S, et al. MDCT of abdominal wall lumbar hernias: anatomical review, pathologic findings and differential diagnosis. *Surg Radiol Anat.* 2012; 34(5): 455-463.
21. van Steensel S, Bloemen A, van den Hil LCL, van den Bos J, Kleinrensink GJ, Bouvy ND. Pitfalls and clinical recommendations for the primary lumbar hernia based on a systematic review of the literature. *Hernia.* 2019; 23(1): 107-117.
22. Karmani S, Ember T, Davenport R. Congenital lumbar hernias: A case report. *J Pediatr Surg.* 2002; 37(6): 921-922.
23. Chung I, Wong KY. Bilateral lumbar hernia. *Hong Kong Med J.* 2019; 25(1): 78-80.

24. Heniford BT, Iannitti DA, Gagner M. Laparoscopic inferior and superior lumbar hernia repair. Arch Surg. 1997; 132(10): 1141-1144.
25. Killeen KL, Girard S, DeMeo JH, Shanmuganathan K, Mirvis SE. Using CT to diagnose traumatic lumbar hernia. AJR Am J Roentgenol. 2000; 174(5): 1413-1415.
26. Moreno-Egea A, Alcaraz AC, Cuervo MC. Surgical options in lumbar hernia: laparoscopic versus open repair. A long-term prospective study. Surg Innov. 2013; 20(4): 331-344.

Figures

Figure 1

Patients underwent lumbar hernia repair with UPP under local anesthesia. A and B: Lumbar hernia anterior and lateral view; C: Fully free exposure of hernia sac; D: The hernia sac was reduced; E: Appearance of mesh device; F: The exposed hernia defect with the mesh placed.

Figure 1

Patients underwent lumbar hernia repair with UPP under local anesthesia. A and B: Lumbar hernia anterior and lateral view; C: Fully free exposure of hernia sac; D: The hernia sac was reduced; E: Appearance of mesh device; F: The exposed hernia defect with the mesh placed.

Figure 2

Abdominal CT showing the hernia content. A: The bilateral lumbar hernia was showed; B: CT demonstrating herniation of part of ascending colon bowel through a right abdominal wall defect; C and D: CT showing local abdominal fat herniation into subcutaneous fat layer in the left lumbar back.

Figure 2

Abdominal CT showing the hernia content. A: The bilateral lumbar hernia was showed; B: CT demonstrating herniation of part of ascending colon bowel through a right abdominal wall defect; C and D: CT showing local abdominal fat herniation into subcutaneous fat layer in the left lumbar back.