



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Left-sided gallbladder (Sinistroposition) encountered during laparoscopic cholecystectomy: A rare case report and review of the literature

Menelaos Zoulamoglou^a, Ioannis Flessas^b, Maria Zarokosta^{a,b,*}, Theodoros Piperos^{a,b}, Ioannis Papapanagiotou^b, Konstantinos Birbas^a, Evangelos Konstantinou^a, Theodoros Mariolis - Sapsakos^{a,b}

^a University Department of Surgery, General and Oncologic Hospital of Kifissia "Agii Anargiri", Athens, Greece

^b Anatomy and Histology Laboratory, Nursing School, University of Athens, Greece

ARTICLE INFO

Article history:

Received 9 October 2016

Received in revised form 5 January 2017

Accepted 5 January 2017

Available online 7 January 2017

Keywords:

Left-sided gallbladder

Sinistroposition gallbladder

Left-sided gallbladder laparoscopic cholecystectomy case report

ABSTRACT

INTRODUCTION: True Left-sided gallbladder (LSG) is a rare anatomical variation with a prevalence of 0.3%. Mainly discovered during the operation, its surgical approach in the laparoscopic setting may be challenging even for an experienced surgeon.

PRESENTATION OF CASE: LSG was unexpectedly discovered in a young man during laparoscopic cholecystectomy. There were no pre-operative indications of this sinistroposition. The laparoscopic cholecystectomy was performed with minor surgical modifications and it was uneventful. A meticulous review of recent literature about LSGs was conducted as well.

DISCUSSION: LSG is a scarce anatomical aberration that is difficultly identified pre-operatively. Surgeons should be aware of this aberration and of its accompanying anatomical variations in order to perform a safe laparoscopic cholecystectomy.

CONCLUSION: Surgeons, by placing the patient to left-side up position, are able to expose the Calot's triangle and possible accompanying anatomical anomalies and thus perform a safe laparoscopic cholecystectomy without difficult surgical modifications.

© 2017 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

First described in 1886 by Hochstetter, true left-sided gallbladder (LSG) remains a scarce anomaly [1] with a prevalence of 0.3%. [2] LSG occurs when the gallbladder is found to the left of the falciform ligament, beneath the left lobe of the liver. It is located between segments III and IV or on segment III [3] to the left of the round ligament. [4] When LSG is encountered laparoscopically, surgical approach may be challenging [3] since its probable accompanying anatomical anomalies might lead to intra-operative injuries. [5] This manuscript has been reported in line with the SCARE guidelines. [6]

2. Presentation of case

A 31-year-old male presented with a 6-month history of colicky pain in the right upper quadrant of the abdomen, that has progressively become worse and the last three days radiated to his right flank. Clinical examination was unremarkable with no Murphy's sign or tenderness, or palpable masses. There was no jaundice, fever or rigors. Vital signs were normal. Liver function tests including serum bilirubin, ALT and AST were within the normal spectrum. No previous surgical history existed. Abdominal ultrasound scan revealed a gall stone about 18 mm in diameter with no evidence of inflammation of the gallbladder. (Fig. 1) Owing to the patient's clinical condition, laparoscopic cholecystectomy was scheduled. At the laparoscopy, after the insertion of a 10 mm umbilical camera port, a true left-sided gallbladder was identified, attached to the inferior surface of segment III of the liver, to the left of the round ligament. (Figs. 2 and 3) Hence, surgeons decided immediately to do some minor surgical modifications to avoid hazardous complications. Firstly, subxiphoid trocar was placed more lateral to the left, under the left subcostal region, for easier surgical maneuvers. The two remained ports were inserted as usual. Secondly, patient was placed to left-side up position for better exposure of the aber-

* Corresponding author at: Anatomy and Histology Laboratory, Nursing School, National and Kapodistrian University of Athens, Papadiamantopoulou 123, Goudi, Athens, Greece.

E-mail addresses: mzarokosta@gmail.com, mzarokos@nurs.uoa.gr (M. Zarokosta).

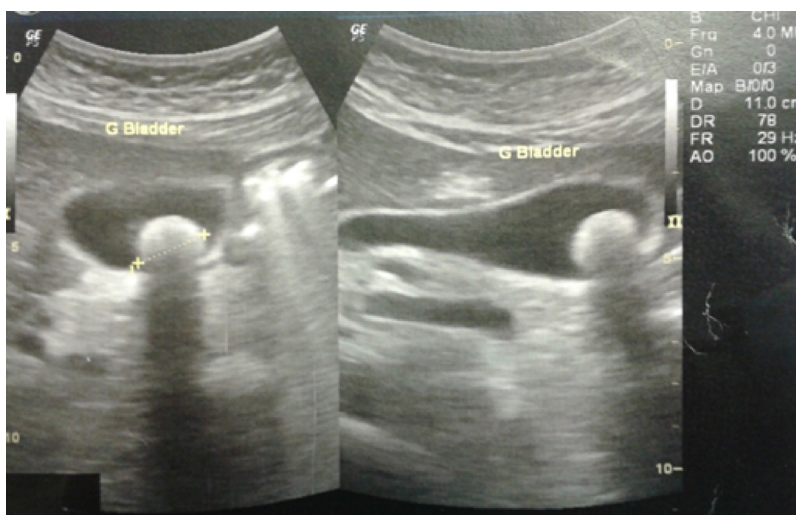


Fig. 1. Abdominal ultrasonography revealing an 18 mm gall stone.

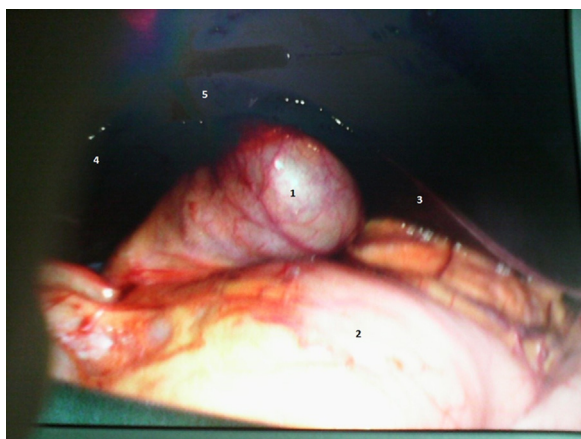


Fig. 2. The LSG placed at the left of the round ligament of the liver. (1: aberrant gallbladder, 2: stomach, 3: left hepatic lobe, 4: right hepatic lobe, 5: round ligament).

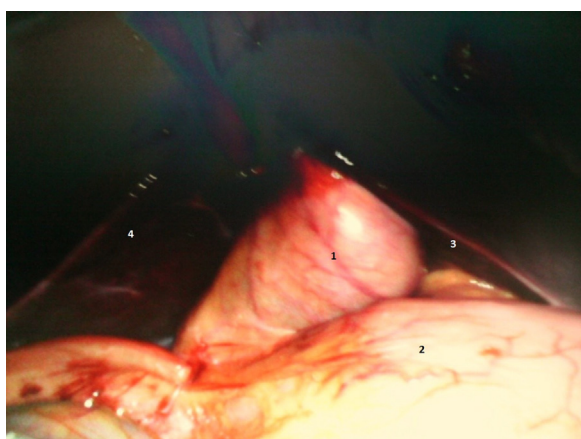


Fig. 3. The aberrant gallbladder attached to the inferior surface of segment III of the liver (1: aberrant gallbladder, 2: stomach, 3: left hepatic lobe, 4: right hepatic lobe).

rant gallbladder and Calot's triangle. No other anatomical variations were found during the laparoscopic cholecystectomy and it continued in the usual fashion uneventfully. The LSG was finally removed through the umbilical port. The patient was discharged the 1st postoperative day without complications.

3. Discussion

True LSGs exist because of two possible embryological etiologies. The first mechanism is due to the attachment and migration of the gallbladder to the left lobe. Hence, the cystic duct is in normal anatomical position and crosses in front of the common duct from right to left. [5] The second one is as follows; a gallbladder develops on each side, with the left-sided gallbladder persisting on the left and the right-sided one becoming atrophic and at last disappearing. In such a case, the cystic duct joins the extrahepatic duct or left hepatic duct from the left side. [7]

Despite being located on the left side of the liver, LSGs usually present with right-sided pain when being symptomatic because, as it is believed, the visceral nerve fibers do not transpose with the gallbladder. Patients commonly present right upper quadrant discomfort, [8] pain radiating to the right flank [9] and positive Murphy's sign. [10] Therefore, signs and symptoms could be misleading [8] and the diagnosis might be missed.

True LSG is commonly discovered at surgery, [5] since pre-operative examination may not detect the anomaly. [11] There are recent cases where neither the common pre-operative ultrasonography detect the LSG [6,12,13] nor the abdominal CT. [5] On the other hand, there are recent cases in which CT revealed LSG [7,9] and if so, further study such as angiography, CT-angiography or MRI are suggested for a well-organized laparoscopic cholecystectomy [14].

A true LSG is closely associated with several anatomical anomalies than can be quite challenging during laparoscopy. [13] Such anomalies are: complete or partial situs inversus, duplicated gallbladder [16] various portal venous [17] and biliary anomalies [8]; cholecystic venous anomaly [7] and atrophy of segment IV of the liver. [12] In addition, the cystic artery always crosses in front of the common bile duct from right to left. [4]

More specifically concerning the accompanying portal vein and biliary anomalies in LSG; Portal vein anatomical variations are categorized in three groups: a) trifurcation type, b) bifurcation type and c) other variations, but they're of limited interest during laparoscopic cholecystectomy. On the other hand, bile duct anomalies have a major role in the morbidity of cholecystectomy in these patients. [13] When LSG exists, the cystic duct may join the left or right side of the common hepatic duct or may join the left hepatic duct directly. [9] Moreover there are recent case reports, referring to hypoplastic bile duct, [16] duplication of the common bile duct, [15] infraportal bile duct [7] and abnormal pancreatico-biliary duct

junction. [8] Occurring to these, an intra-operative cholangiography might be used as a guide to the dissection [15] since delineating biliary anatomy. [10]

Although the presence of LSG with its usual anatomical anomalies might lead to intra-operative injuries [5,18] laparoscopic cholecystectomy is the treatment of choice. [9] The feasibility of laparoscopic cholecystectomy with minor modifications in patients with LSG has been confirmed in various case reports as in the presented one as well. Firstly, there are recent case reports suggesting “mirror image” setup. [9,12,19] Others suggest use of accessory ports. [2,8,20] Moreover, a single-incision at the umbilicus with insertion of two ports; one for the camera and one for working is suggested. [3] Another choice suggested, is minor modification to the entry sites of the trocars, [10] as performed in the present case, with a minimal modification of the entry site of the subxiphoid trocar.

4. Conclusion

In conclusion, true LSG is a scarce anatomical anomaly that is difficult to be identified preoperatively. Therefore, surgeons should be aware of this aberration and, by placing the patient to left-side up position, are able to expose the Calot's triangle and possible accompanying anatomical anomalies and thus, perform a safe laparoscopic cholecystectomy without difficult surgical modifications.

Conflict of interest

None.

Funding

There is no source of funding.

Consent

Written consent was provided from the patient for the publication of this case report and accompanying images.

Contributions

Mariolis and Zoulamoglou conceived of the study and participated in its coordination. Birbas and Konstantinou contributed to the acquisition of clinical data, its analysis and interpretation and to the preparation of images. Zarokosta and Piperos carried out the literature review. Flessas and Papapanagiotou contributed to the preparation of the manuscript. Zoulamoglou, Mariolis and Flessas contributed to the refinement of the case report. All authors have approved the final article.

References

- [1] A. Dhulkotia, S. Kumar, V. Kabra, H.S. Shukla, Aberrant gallbladder situated beneath the left lobe of liver, *HPB (Oxford)* 4 (1) (2002) 39–42.
- [2] Prasanna Kumar Reddy, R Venkata Subramanian Yuvaraja, Laparoscopic cholecystectomy for left-sided gallbladder (Sinistroposition), *JLS* 9 (July–September (3)) (2005) 356–357.
- [3] Steven R. Bonomo, Benjamin R Veenstra, Thomas M Komar, Harry M. Richter, Single-incision cholecystectomy for left-sided gallbladder, *JLS* 18 (April–June (2)) (2014) 338–341.
- [4] R.K. Chrungoo, S.L. Kachroo, Ashwani K. Sharma, Arshad Bashir Khan, Aga Syed Nadim, Left-sided gall bladder: report of two cases, *J. Minim. Access Surg.* 3 (July–September (3)) (2007) 108–110.
- [5] E. Mazen, Agnes Iskandar, Merab Radzio, I. Krikhely, Michael Leitman, Laparoscopic cholecystectomy for a left-sided gallbladder, *World J. Gastroenterol.* 19 (September (35)) (2013) 5925–5928.
- [6] R.A. Agha, A.J. Fowler, A. Saetta, I. Barai, S. Rajmohan, D.P. Orgill, for the SCARE Group, The SCARE statement: consensus-based surgical case report guidelines, *Int. J. Surg.* 34 (October) (2016) 180–186.
- [7] Hiromichi Ishii, Akinori Noguchi, Mie Onishi, Koji Takao, Takahiro Maruyama, Hiroaki Taiyoh, Yasunobu Araki, Takeshi Shimizu, Hiroyuki Izumi, Naoki Tani, Masahide Yamaguchi, Tetsuro Yamane True left-sided gallbladder with variations of bile duct and cholecystic vein, *World J. Gastroenterol.* 21 (June (21)) (2015) 6754–6758.
- [8] Sagar Sadhu, Tarshid A Jahangir, Manas K. Roy, Left-sided gallbladder discovered during laparoscopic cholecystectomy in a patient with dextrocardia, *Indian. J. Surg.* 74 (April (2)) (2012) 186–188.
- [9] S. Alharthi, M. Bernon, J.E.J. Krige, Beware the left-sided gallbladder, *S. Afr. J. Surg.* 50 (3) (2012) 88–89.
- [10] Irfan Qureshi, Ziad Awad, Aberrant presentation of the gallbladder during laparoscopic cholecystectomy, *JLS* 13 (October–December (4)) (2009) 605–607.
- [11] A. Makni, H. Magherbi, R. Ksantini, W. Rebai, Z.B. Safta, Left-sided gallbladder: an incidental finding in laparoscopic cholecystectomy, *Asian J. Surg.* 35 (2012) 93–95.
- [12] G. Zografos, E. Lagoudianakis, D. Grosomanidis, N. Koronakis, D. Tsekouras, J. Chrysikos, K. Filis, A. Manouras, Management of incidental left-sided gallbladder, *JLS* 13 (April–June (2)) (2009) 273–275.
- [13] C. Nastos, A. Vezakis, I. Papaconstantinou, T. Theodosopoulos, V. Koutoulidis, G. Polymeneas, Methods of safe laparoscopic cholecystectomy for left-sided (sinistroposition) gallbladder: a report of two cases and a review of safe techniques, *Int. J. Surg. Case Rep.* 5 (10) (2014) 769–773.
- [14] Sheng-Lung Hsu, Tai-Yi Chen, Tung-Liang Huang, Cheuk-Kwan Sun, Allan M Concejero, Leo Leung-Chit Tsang, Yu-Fan Cheng, Left-sided gallbladder: its clinical significance and imaging presentations, *World J. Gastroenterol.* 13 (December (47)) (2007) 6404–6409.
- [15] Elizabeth A. Bender, Sara Springhetti, Kamal Shemisa, Justine Wittenauer, Left-Sided gallbladder (Sinistroposition) with duplication of the common bile duct, *JLS* 11 (Jan–Mar 1) (2007) 148–150.
- [16] R. Colovic, N. Colovic, G. Barisic, H.D.E. Atkinson, Z. Krivokapic, Left-sided gallbladder associated with congenital liver cyst, *HPB (Oxford)* 8 (April (2)) (2006) 157–158.
- [17] R. Kawai, K. Miyata, N. Yuasa, E. Takeuchi, Y. Goto, H. Miyake, H. Nagai, M. Hattori, J. Imura, Y. Hayashi, J. Kawakami, Y. Kobayashi, True left-sided gallbladder with a portal anomaly: report of a case, *Surg. Today* 42 (2012) 1130–1134.
- [18] T.A. Moo-Young, D.D. Picus, S. Teefey, S.M. Strasberg, Common bile duct injury following laparoscopic cholecystectomy in the setting of sinistroposition of the gallbladder and biliary confluence: a case report, *J. Gastrointest. Surg.* 14 (1) (2010) 166–170.
- [19] N. Matsumura, H. Tokumura, A. Yasumoto, Laparoscopic cholecystectomy and common bile duct exploration for cholecystocholedocholithiasis with a left-sided gallbladder: report of a case, *Surg. Today* 39 (3) (2009) 252–255.
- [20] R. Donthi, D.J. Thomas, D. Sanders, S.P. Schmidt, Report of laparoscopic cholecystectomy in two patients with left-sided gallbladders, *JLS* 5 (1) (2001) 53–56.

Open Access

This article is published Open Access at [sciencedirect.com](https://www.sciencedirect.com). It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.