A case report of double cystic duct during laparoscopic cholecystectomy in patient with chronic calculic cholecystitis

Ahmed Mohammed Abdelsalam *, Ahmed Mohammed Salah Eldeen Elansary, Abdelrahman Mostafa Ibrahim Mohamed

Faculty of Medicine, Cairo University, Kasr Alainy St., Cairo, 11562, Egypt

**A R T I C L E   I N F O**

Article history:
Received 27 May 2020
Received in revised form 16 October 2020
Accepted 17 October 2020
Available online 23 November 2020

Keywords:
Case report
Double cystic duct
Cholecystectomy

**A B S T R A C T**

**INTRODUCTION:** Abnormal anatomy of the biliary tree predisposes patients to higher risks of ductal injury and postoperative complications. One of the extremely rare abnormalities of the cystic duct is the duplication of the cystic duct with a single gallbladder. The diagnosis is usually established during surgery, we report a case of double cystic duct with literature review.

**PRESENTATION OF CASE:** A forty-two years old female patient who complained of recurrent biliary colic 9 months prior to the presentation. Murphy's sigh was negative and with no other relevant clinical signs. **DIAGNOSIS AND THERAPEUTIC INTERVENTION:** Abdominal ultrasound showed multiple gall stones; the largest one was about 11 mm in diameter. Laparoscopic cholecystectomy was done under general anesthesia with 4 ports insertion. A double cystic duct accidentally encountered after clipping and cutting what was apparently a single cystic duct. Intraoperative cholangiogram was done to confirm the anomaly and exclude CBD injury.

**CONCLUSION:** Double cystic duct is a very rare variant of the cystic duct anomaly. Proper knowledge of this anomaly should be kept in mind to avoid any unnecessary steps.

© 2020 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**

   Abnormal anatomy of the biliary tree predisposes patients to higher risks of ductal injury and postoperative complications. As it is known the congenital abnormalities of the extrahepatic biliary duct system are possibly the most frequent variations of the human body [1].

   One of the extremely rare abnormalities of the cystic duct is the duplication of the cystic duct with a single gallbladder. The diagnosis is usually established during surgery [2]. Only 17 cases have been reported in literature [3–18].

   We report a case of a female who had two separate cystic ducts exiting from a single gallbladder managed in academic institution.

2. **Patient information**

2.1. **Demographic data**

   Forty-two years old female patient, housewife, with BMI 30 kg/m².

2.2. **Presentation**

   She is presented with recurrent biliary colic 9 months prior to the operation and she was referred by her family doctor.

2.3. **Past medical and surgical history**

   She was medically free with negative past surgical history.

2.4. **Drug history, family history and smoking history**

   No relevant drug history, family history nor any relevant genetic information. There was no smoking history nor other special habits of medical importance.

3. **Clinical finding**

   Murphy's sign was negative and other clinical findings was irrelevant.

4. **Timeline**

   The patient presented 9 months prior to intervention.
5. Diagnostic assessment

5.1. Diagnostic methods

Vital signs, blood examination, electrocardiography and echocardiography were within normal range. Abdominal ultrasound showed multiple gall stones, largest one about 11 mm in diameter. Oesophago-gastro-duodenoscopy (OGD) was to exclude reflux oesophagitis as she gave history of dyspepsia; it was normal.

5.2. Diagnostic challenges

There were no financial challenges as the patient was treated in an academic institution– our institution –.

6. Therapeutic intervention

6.1. Pre-intervention considerations

Patient optimization for the intervention took place by careful full examination and pre-operative assessment.

6.2. Type of intervention

Laparoscopic cholecystectomy.

6.3. Peri-intervention consideration

Laparoscopic cholecystectomy was performed under general anesthesia with 4 ports insertion; visual umbilical port 10 mm, the 1st working port was 10 mm subxiphisternum to the right, the 2nd working port was 5 mm put at the level of the fundus of gall bladder and finally the assistant port was 5 mm at anterior axillary line 10 cm from costal margin.

Dissection started in the triangle of Calot and critical view of safety was identified then the cystic duct was clipped with two titanium clips proximally and a distal one at the gall bladder.

A double cystic duct accidentally detected after cutting what was apparently single wide cystic duct (Fig. 1). An intraoperative cholangiogram was performed to make sure it’s a double cystic duct as for the first instance the double lumen gave the impression of transected Common Bile Duct (CBD) (Fig. 2).

After making

A 16-Fr tube drain was put.

6.4. Operator

Lecturer and consultant of general surgery at our institution

6.5. Post-intervention consideration

The patient had a smooth post-operative recovery and was discharged home on day two post-operatively.

6.6. Post-operative considerations

The patient was instructed to be on fat-free diet four weeks after surgery and to follow-up in the outpatient clinic.

SCARE 2018 paper was used for the construction of this paper [20].

7. Follow up and outcome

a. The operative pictures and the intra-operative cholangiogram images are attached in Figs. 1 and 2 respectively.

b. The patient was followed up clinically after two weeks of discharge and the follow-up was unremarkable

c. Intervention adherence: the procedure and follow-up were done according to what is generally accepted in such cases of laparoscopic cholecystectomy.

d. Complications: the patient had a smooth post-operative recovery with no complications.

8. Discussion

A double CD is an uncommon variation that poses a critical challenge. It is associated with a double gallbladder 80% of the time [19]. Cases of a single gallbladder with a double cystic duct have rarely been reported in the English and European literature [9,10]. Pre-vious studies showed that the variant CD are also classified into ‘H’ type where an accessory duct joins the right, left or CHD, trabecular type in which the accessory duct directly enters the liver substance and ‘Y’ type where both ducts meet and form a single duct [19].

Our case was a double cystic duct originating from single gall bladder drained by separate opening to common hepatic duct. Intraoperative cholangiogram was performed to confirm this finding.

According to our experience it is recommended the use of intraoperative cholangiography when dealing with abnormal anatomy or congenital anomalies of the gallbladder. The evidence is anecdotal but as shown on this case report clearly seen two cystic ducts accurately diagnosed a gallbladder and prevented the surgeon from leaving an unidentified duct which later can become a challenging problem for surgeon also double cystic duct is very challenging due to laparoscopic cholecystectomy.

Table 1 shows literature review of the reported cases of double cystic duct (DCD).

9. Patient perspective

The procedure of laparoscopic cholecystectomy was explained to the patient with all advantages and possible complications. She agreed on the procedure and informed consent was taken from her.
Table 1

| Reference/author | Year | Age/gender | Gall bladder |
|------------------|------|------------|--------------|
| 1 Heyas et al.    | 1931 | 35/male    | Double       |
| 2 Kennon         | 1933 | 69/male    | Double       |
| 3 Wilson         | 1939 | 55/female  | Double       |
| 4 Paraskevas et al. | 1998 | 76/female  | Single       |
| 5 Nakasugi et al. | 1995 | 50/female  | Single       |
| 6 Hiroto et al.  | 1997 | 74/female  | Single       |
| 7 Tsutsumi et al. | 2000 | 74/female  | Single       |
| 8 Shivhare et al. | 2002 | 46/female  | Single       |
| 9 Huston et al.  | 2006 | 43/female  | Single       |
| 10 Yoo et al.    | 2008 | 55/female  | Single       |
| 11 Vicente et al.| 2009 | Newborn    | Single       |
| 12 Górkem et al. | 2014 | 10/male    | Double       |
| 13 Otaibi et al. | 2015 | 54/male    | Single       |
| 14 Samnani et al.| 2015 | 43/female  | Single       |
| 15 Wei et al.    | 2015 | 66/female  | Double       |
| 16 A.A. Agha      | 2016 | 30/female  | Single       |
| 17 M. Abdelsalam et al. | 2017 | 33/female | Single       |

Registration of research studies

Not Applicable.

Guarantor

Ahmed M. Abdelsalam.

Provenance and peer review

Not commissioned, externally peer-reviewed.

References

[1] A. Senapati, J.H. Wolfe, Accessory cystic duct—an operative hazard, J. R. Soc. Med. 77 (October (10)) (1984) 845–846.
[2] A. Senapati, J.H. Wolfe, Accessory cystic duct—an operative hazard, J. R. Soc. Med. 77 (October (10)) (1984) 845–846.
[3] C.P. Spanos, T. Syarakos, Bile leaks from the duct of Luschka (subvesical duct): a review, Langenbecks Arch. Surg. 391 (September (5)) (2006) 441–447.
[4] R. Hayes, Double gall bladder, with double cystic duct: case report, Radiology 16 (January (1)) (1931) 66–67.
[5] R. Kennon, A double gall-bladder opening by two cystic ducts into the common bile-duct, Br. J. Surg. 20 (January (79)) (1933) 522.
[6] C.L. Wilson, Double gallbladder with two cystic ducts and two cystic arteries, Ann. Surg. 110 (July (1)) (1939) 60.
[7] G. Paraskevas, B. Papazigos, K.S. Natsis, et al., An accessory double cystic duct with single gallbladder, Chirurgia (Bucharest, Romania: 1990) 102 (December (2)) (2006) 223–225.
[8] N. Nakasugi, S. Kobayashi, S. Nakamoto, et al., A case of double cystic duct with choledocholithiasis treated by laparoscopy, J. Hepato-Biliary Surg. 2 (March 1) (1995) 68–71.
[9] H. Hiroto, Y. Takita, N. Nitta, et al., Double cystic duct found by intraoperative cholangiography in laparoscopic cholecystectomy, Surg. Laparosc. Endosc. Percutaneous Tech. 1 (June 3) (1997) 263–265.
[10] S. Tsutsumi, Y. Hosouchi, T. Shimura, et al., Double cystic duct detected by endoscopic retrograde cholangiopancreatography and confirmed by intraoperative cholangiography in laparoscopic cholecystectomy: a case report, Hepatogastroenterology 47 (December (35)) (1999) 1266–1268.
[11] R. Shivhare, S.S. Sikora, Double cystic duct: a rare biliary anomaly encountered at laparoscopic cholecystectomy, J. Laparoendosc. Adv. Surg. Tech. A 12 (October (5)) (2002) 391–392.
[12] T.L. Huston, G.F. Dakin, Double cystic duct, Can. J. Surg. 51 (February (1)) (2008) 9.
[13] J. Yoo, D. Shin, An accessory double cystic duct with a single gall bladder, J. Korean Surg. Soc. 74 (April (4)) (2008) 319–321.
[14] H. Lugo-Vicente, M. Correa, H. Brunet, Double cystic duct in a child with intractable association: a case report, Bol. Asoc. Med. Puerto Rico 103 (2) (2009) 56.
[15] S.B. Gürkem, S. Doganay, G. Kahrman, et al., Acute cholecystitis of a duplicated gallbladder with double cystic duct in a 10-year-old boy, Balkan Med. J. 31 (December (4)) (2014) 366.
[16] W. Otaibi, G. Quach, B. Burke, Double cystic duct in a septated gallbladder, J. Invest. Med. High Impact Case Rep. 3 (April (2)) (2015) 2324709615570105.

Declaration of Competing Interest

The authors report no declarations of interest.

Funding

No Funds to be stated.

Ethical approval

No ethical approval as it was a routine laparoscopic cholecystectomy.

Consent

Written informed consent was obtained from the patient 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

Ahmed M. Abdelsalam: Main operator.
Ahmed Mohamed salah: Editing the review.
Abdelrahman Mostafa: Assistant in the procedure.

Fig. 2. Showed intact extrahepatic biliary tree after clipping double cystic duct using intraoperative cholangiogram.
[17] S.S. Samnani, A. Ali, Y variant of double cystic duct: incidental finding during laparoscopic cholecystectomy, Indian J. Surg. 77 (December (Suppl 3)) (2015) 1491.

[18] W. Yu, H. Yuan, S. Cheng, et al., A double gallbladder with a common bile duct stone treated by laparoscopy accompanied by choledochoscopy via the cystic duct: a case report, Exp. Ther. Med. 12 (December (6)) (2016) 3521–3526.

[19] R.A. Agha, A.J. Fowler, A. Saetta, et al., The SCARE statement: consensus-based surgical case report guidelines, Int. J. Surg. 34 (2016) 180–186.

[20] T.L. Huston, G.F. Dakin, Double cystic duct, Can. J. Surg. 51 (2008) E8–E10.

Open Access
This article is published Open Access at sciedirect.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.