

The impact of gender on difficulty of classical open cholecystectomy

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ABSTRACT

Background: Cholecystectomy demands attention, and expectation of abnormal anatomy in the veins, arteries or ducts. Prediction of difficult cholecystectomy does not only help in patient counseling but also helps the surgeon to prepare better for the technical difficulties that may be encountered¹⁻³.

The aim: To find out whether there is impact of gender on the difficulty of surgery during open cholecystectomy.

Patients and methods: This is a prospective hospital based study. Patients who presented to Ibn Sina Hospital for open cholecystectomy during the period from April 2011 to April 2012 were included in this study. Special emphasis was put on gender, the operative time, difficulty of surgery and complications of open cholecystectomy. A pre-tested questionnaire was filled during interview of patients and operating surgeons.

Results: A total 327 operations were included in the study. Of them there were 34(64.2%) males and 99(36.1%) females presented early i.e. after the first diagnosis was made. The mean operative time was 44.6 min for males and 43.57 min for females. Difficult surgery was described in 6(11.3%) of male and 23(8.4%) females.

Conclusion: There was no significant statistical difference in the operative time, difficulty of operation and complication rate between males and females.

Key words: Open cholecystectomy, difficulty, gender.

Cholecystectomy demands attention to details and expectation to encounter anomalous anatomy. Prediction of a difficult cholecystectomy does not only help in patient counseling but also helps the surgeon to prepare better for the intra-operative technical difficulties.

Aim: To find out whether there is impact of gender on the difficulty of surgery during open cholecystectomy.

Patients and methods:

Study design: This is a prospective descriptive hospital based study designed to compare the gender differences in time of operation, difficulty and complications of open cholecystectomy.

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Study duration: The study was conducted in the period from April 2011- April 2012.

Set up: Ibn Sina Hospital is a specialised tertiary care hospital in which the National Centre for Gastrointestinal and Liver Diseases is based.

Inclusion criteria: Patients who were admitted for open cholecystectomy during the study period were included after accepting and signing the informed consent.

Exclusion criteria: Patients who underwent laparoscopic cholecystectomy and who underwent CBD exploration were excluded.

The study variables: The study was based on outcome of surgery in males and females, the operative time, the difficulty met during surgery as expressed by the operating surgeon, and complications of open cholecystectomy.

Data collection tools: A structured pretested questionnaire was used to determine indicators of difficulty and the complications in both male and female patients.

Statistical analysis: The data was analyzed using Statistical Package for Social Sciences (SPSS) version 16. Two sample *t*-test was used with significant statistical difference taken at $P < 0.05$.

Ethical clearance: Ethical clearance was obtained from the Ethical Committee at Sudan Medical Specialization Board and from the hospital administration through the head of the Gastrointestinal Unit. Also, informed consent was obtained from every participant.

Limitation of the study: The study didn't consider the experience differences and skills of the different operating surgeons. The vast majority of operators in open cholecystectomy were registrars in the qualifying training programme for general surgery. Yet, few cases were operated by consultant surgeons.

Results:

A total of 327 patients were included in this study. They were 53 (16.2%) males and 274 (83.8%) females, with male to female ratio about 1:5. The mean (\pm SD) age for males was 51.7 ± 1.34 and for females was 44.7 ± 1.27 years ($P = 0.077$). Distribution of age showed that 32.1% of males were in the age group 51-60 years and 28.1% females in the age group 41-50 years. Males above 60 years were 12 and comprised 22.7% of total males whereas women above 60 years were 24 and represented 8.8% of total females.

Most of the patients i.e. 205 (62.7%) were from rural areas. Male patients from the city were 28 (52.8%) and female patient from the rural areas were 180 (65.7%). Regarding the occupation, 25 (47.2%) males were labourers followed by 12 (22.6%) unemployed or on pension. On the other hand 220 (70.9%) females were unemployed and whereas the female employees constituted 32 (11.7%). The data showed that 151 (46.2%) of the patients were covered by health insurance while 30 (56.6%) males and 146 (53.3%) females were not covered.

Regarding the time between the first related symptom and surgery, 42 (79.3%) males and 164 (59.9%) females presented in the first year of onset of symptoms. The mean delay since the start of symptoms was 2.28 months

for males and 3.84 months for females ($P = 0.051$). The main reason for delay in males was the cost of surgery in 9 (17%) males, where as it was reluctance of the guardian and refraining of surgery in 100 (36.5%) females.

The mean operative time was 44.6 minutes for males and 43.6 minutes for females ($P = 0.469$) (time was taken from incision to closure) (range 30 - 90 min) for both sexes.

The operating surgeons admitted to have encountered difficulty during operation of 6 (11.3%) males and 23 (8.4%) females ($P = 0.493$). The operating surgeons reported unclear anatomy in 1 (1.9%) male patients and 3 (1.08%) female patients. Bleeding was difficult to control in 2 (3.8%) male open cholecystectomies and 9 (3.27%) of females operations. Dense adhesions were found in 3 (5.7%) male and 9 (3.27%) of the female operations. Thick-walled oedematous gallbladder was reported only in 6 (2.19%) female cases. Leak of bile and/or slippage of stone during surgery had occurred only in 4 (1.45%) female operations. Fibrotic contracted gallbladder was in 3 (5.7%) males and in 1 (0.36%) female operation.

Difficult operations in 3 (5.66%) males and 10 (3.6%) females were performed without help or complications. Insertion of drain was required in 3 (5.7%) of male and 9 (3.28%) female cholecystectomies. However, call for senior advice was needed during 1 (1.9%) of male and 7 (2.55%) female operations. Senior surgeon intervened in 1 (1.9%) of male and 4 (1.45%) female operations. Complication was encountered in one female ($P = 0.926$) as abscess collection making a morbidity of (0.36%).

Difficult operations took from 45-60 min in 19 (65.5%) and more than 60 min in 8 (27.5%) operations. On the other hand, easy cases who took <45 min in 168 (56.4%), while 129 (43.3%) took 45-60 min ($P = 0.748$).

Discussion:

In our study male to female ratio was 1:5. This is in keeping with reports from Pakistan⁴. In contrast, Daou R from Lebanon Saeed Nasir T from Karachi and Amir M from Islamabad reported varying male to

female ratio as (1:3), (1:9) and (1:9) respectively^{5,6,7}.

Although the mean age of males (51.7 years) was higher than females (44.7 years), this does not carry significant statistical difference between the two sexes ($P=0.077$). So, the two studied groups were similar in age. The age of our studied patients was similar to that published by Amir M from Islamabad⁷, and consistent with the literature from Taiwan⁸.

In our study, there was no significant statistical difference in the operative time for the male and female patients ($P=0.469$). This correlates well with the operative duration reported by Abdulmohsen A. Al-Mulhim⁹. In the contrary, Foad Ali Moosa⁴ and Amir M⁷ stated that the mean operative time was significantly higher for males as compared to female ($P<0.05$). Amir M⁷ concluded that male gender was a high risk factor in comparison to female gender resulting in a longer duration of surgery and length of postoperative hospitalization

In our study there was no significant statistical difference in the difficulty of open cholecystectomy between both the two sexes ($P=0.493$). This is not consistent with studies from Mac-Donald's, who showed that males commonly present with acute subset than females¹⁰. Also Glenn and Dillon reported that the clinical course of acute cholecystitis was more fulminant in men¹¹. In Koo and Thirlby study there was high percentage of males with acute cholecystectomies¹². While Morrow et al. found higher number of male patients who failed medical therapy and required surgery during their hospital admission¹³. Wilson et al. identified high frequency of gangrenous cholecystitis among old male patients undergoing urgent or emergency cholecystectomy¹⁴. Margiotta et al. reported that men tend to have an emergency biliary surgery with mortality rate higher than for women¹⁵. Foad Ali Moosa reported that independent variables measured included that acute cholecystitis; acute suppurative cholecystitis (empyema) and pancreatitis were all common among males⁴. Volcan Genk from Turkey showed that conversion to open cholecystectomy due to

intra-operative haemorrhage, obscured anatomy by adhesions, severe inflammation and fibrosis of Calot's triangle was 2.5-fold higher in men than in women¹⁶.

Our findings in the operative time we have encountered is in keeping with Amir M, from Islamabad who stated that although operating time was higher in males but neither difficulty nor complications were affected by gender difference⁷. However, Abdulmohsen A. Al-Mulhim reported that male gender was not an independent predictor of difficult operation⁹. On the other hand, Ibrahim et al. concluded that he was unable to determine the effect of gender on difficulty. He explained that the low incidence of obesity among males, low incidence of previous abdominal surgery in males (as compared to the female gynaecological procedures), the uniform approach of experienced surgeons performing the operations were factors potentially affected the outcome of surgery so that gender had no role in difficulty¹⁷.

To this point, in the discussion appears, whether men with acute presentation had a different outcome than in elective cases. If acute presentation is a factor, why it appears in men more frequently? Is it because they are the main breadwinners for their families and hence tend to look for conservative management? Mc Manus PL in his structured analysis of literature support that acute cholecystitis, but not the male gender, is the strongest significant risk factor for complications. In addition, other risk factors, such as abdominal pain, tenderness, leucocytosis and ultrasound findings of an oedematous gallbladder, are all related to the acute pathology¹⁸.

On the other hand, in our study males tend to present earlier than females i.e. 79.3% male compared to 59.9% females presented with in the first year from onset of symptoms. The mean delay for males was 2.28 months compared to 3.84 months for females. This contradicts the finding of Glenn and Dillon and Margiotta et al. who stated that the higher mortality and morbidity rate in males may reflect an unwillingness of male patients to seek medical attention until their disease is

advanced^{11,15}. Also John C. Russell, Stephen J. Walsh, questioned the gender differences in patient behaviours, (e.g., the threshold for seeking medical care, or accepting physician recommendations for surgical intervention) cause delay in male patients¹⁹. In addition, Huang J, Chang CH, in their epidemiological study of severe gallstone disease in Taiwan concluded that, women use all forms of health services, including hospital services, more frequently than men²⁰. Yet, our findings can be justified by that in our male patients predominantly came from the city (52.8%) while in females were predominantly from rural areas (65.7%). If this is to be validated by further studies, it will reflect change in the local culture of our citizens. Medical insurance seems not to have any impact on the mode of presentation because insurance covered 56.6% of males and 53.3% of females.

Conclusion:

With the experience of the operating surgeons at Ibn Sina Hospital at the time of the study, the hypothesis of gender impact on difference in difficulty of surgery, length of operative time and complication rate was not proved in this study. For validation of this conclusion local multi-centric data are needed to be analyzed.

References:

- David McAneny. Open cholecystectomy. *Surg Clin N Am*. 2008;88: 1273–1294.
- Visser BC, Parks RW, Garden OJ. Open cholecystectomy in the laparoscopic era. *Am J Surg*. 2008;195:108–14.
- MAM Ibnouf, A.Majid M. Massaad. Iatrogenic Major Bile duct Injuries Injury. *Sudan JMS*. 2007;2(3): 201-207.
- Foad Ali Moosa, Farha Idrees, Naheed Sultan. Is male gender a risk factor for cholecystectomy? *Medical Channel* 2010;16 (4): 541-548.
- Daou R. Cholecystectomy using a mini laparotomy. *Ann Chir* 1998;52(7):625-8.
- Saeed, Nasir T, Burki B, Channa GA. Mini-open cholecystectomy in the management of cholelithiasis a feasible option. *J Ayub Med Coll Abbottabad* 2010 Jul-Sep;22(3):68-70.
- Amir M, Haider M H. Open -cholecystectomy in terms of operative success and complications. *J Coll Physicians Surg Pak* 2007 May;17(5):269-71.
- Shih-Chang Hung, Kuan-Fu Liao, Shih-Wei Lai Risk factors associated with symptomatic cholelithiasis in Taiwan. *BMC Gastroenterology* 2011; 11:111.
- Abdulmohsen A. Al-Mulhim. Male Gender is not a Risk Factor for the Outcome of Cholecystectomy: A Single Surgeon Experience Saudi J Gastroenterol. 2008 April; 14(2):73–79.
- MacDonald JA. Early cholecystectomy for acute cholecystitis. *Can Med Assoc J*. 1994;111:796-799.
- Glenn F, Dillon LD. Developing trends in acute cholecystitis and choledocholithiasis. *Surg Gynecol Obstet* 1998; 151:528-532.
- Koo KP, Thirlby RC. Laparoscopic cholecystectomy in acute cholecystitis. *Arch Surg*. 1996; 131:540-545.
- Morrow DJ, Thompson J, Wilson JE. Acute cholecystectomy in the elderly. *Arch Surg*. 1988; 113:1149-1152.
- Wilson AD, Kozol RA, Salwa WA, et al. Gangrenous cholecystitis in an urban VA hospital. *J Surg Dis* 1999;56:402-404.
- Margiotta SJ, Horwitz JR, Willia IH, et al. Cholecystectomy in the elderly. *Am J Surg* 1998;156:509-512.
- Volcan Genk, Marlen Sulaimanov. What necessitates the conversion to open cholecystectomy? A retrospective analysis of 5164 consecutive laparoscopic operations clinics (Sao Paulo). 2011;66(3): 417–420.
- Ibrahim S, Hean TK, Ho LS, et al. Predicting risk factors for difficult surgery in patients undergoing cholecystectomy. *World J Surg* 2006; 30: 698–704.
- McManus PL, Wheatley KE. Consent and complications in open cholecystectomy: Risk disclosure varies widely between individual surgeons. *Ann R Coll Surg Engl*. 2003;85:79–82.
- John C. Russell, Stephen J. Walsh, Lori Reed-Fourquet. Symptomatic cholelithiasis: A different disease in men? *Ann Surg* 1998;227(2): 195-200.
- Huang J, Chang CH, Wang JL, Kuo HK, Lin JW. Nationwide epidemiological study of severe gallstone disease in Taiwan. *BMC Gastroenterology* 2009; 9:63.