The impact of gender on difficulty of classical open cholecystectomy

Mohamed Khalifa M. Idris, Elsaggad E.A. Mohamed, M. A. M. Ibnouf, A. Magid M. Massaad, Mutaz S. Abdelaziz, Tarig M. Husein, Amir A Hamza, Tarig Abbas Elbakhiet

ABSTRACT

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

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.
**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 (±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 patients from the rural areas were 180(65.7%). Regarding the occupation, 24(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 180(65.7%). 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$0.051). The main reason for delay in males was the cost of surgery in 9 (17%) males, whereas as it was reluctance of the guardian and refraining of surgery in 100 (36.5%) females. The mean operative time was 44.6 minutes for males and 43.6 minutes for females ($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 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%) male 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%) of female cholecystectomies. However, call for senior advice was needed during 1(1.9%) of male and 7(2.55%) of 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 45-60min 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 Pakistan. 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\textsuperscript{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 (P0.077). So, the two studied groups were similar in age. The age of our studied patients was similar to that published by Amir M from Islamabad\textsuperscript{7}, and consistent with the literature from Taiwan\textsuperscript{8}.

In our study, there was no significant statistical difference in the operative time for the male and female patients (P0.469). This correlates well with the operative duration reported by Abdulmohsen A. Al-Mulhim\textsuperscript{9}. In the contrary, Foad Ali Moosa\textsuperscript{4} and Amir M\textsuperscript{7} stated that the mean operative time was significantly higher for males as compared to female (P<0.05). Amir M\textsuperscript{7} 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 females\textsuperscript{10}. Also Glenn and Dillon reported that the clinical course of acute cholecystitis was more fulminant in men\textsuperscript{11}. In Koo and Thirlby study there was high percentage of males with acute cholecystectomies\textsuperscript{12}. While Morrow et al. found higher number of male patients who failed medical therapy and required surgery during their hospital admission\textsuperscript{13}. Wilson et al. identified high frequency of gangrenous cholecystitis among old male patients undergoing urgent or emergency cholecystectomy\textsuperscript{14}. Margiotta et al. reported that men tend to have an emergency biliary surgery with mortality rate higher than for women\textsuperscript{15}. Foad Ali Moosa reported that independent variables measured included that acute cholecystitis; acute suppurativecholecystitis (empyema) and pancreatitis were all common among males\textsuperscript{4}. 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 women\textsuperscript{16}.

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 difference\textsuperscript{9}. However, Abdulmohsen A. Al-Mulhim reported that male gender was not an independent predictor of difficult operation\textsuperscript{7}. 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 difficulty\textsuperscript{17}.

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 pathology\textsuperscript{18}.

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\textsuperscript{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 patients\textsuperscript{19}. 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 men\textsuperscript{20}. 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:**