RESULTS

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Over the period of our study, from May 1993 to December 1994, 300 patients were admitted to our surgical department with symptomatic cholecystitis.

Twenty patients were scheduled directly for open cholecystectomy because of the presence of contraindication to laparoscopic cholecystectomy while the remaining 280 patients underwent laparoscopic cholecystectomy as the primary procedure and constitute the study population (Table 1).

Of the 280 patients underwent laparoscopic cholecystectomy, 254 were female (90.7%) and 26 were male (9.3%). Ages ranged from 19 years to 56 years, with an average age of 38 years. 154 patients (55%) presented by severe biliary colic and flatulent dyspepsia, 84 patients (30%) presented by mild biliary colic while 42 patients (15%) presented by dyspepsia which not relieved by medical treatment. 238 patients (85%) had the diagnosis of cholelithiasis while the remaining 42 patients (15%) had the diagnosis of non - calcular cholecystitis, all are proved before operation by ultrasonography (Table 2).

Table (1): Patients considered unsuitable for laparoscopic procedure (20 patients)

Remarks	No. of patients	(%)
- Stone CBD	8	40%
- Previous history of jaundice	4	20%
- Acute cholecystitis with palpable RHC mass	2	10%
- Previous incisional hernia in the upper abdomen repaired by mesh.	3	15%
- Cardiopulmonary insufficiency	2	10%
- Portal hypertension	1	5%

CBD = Common bile duct.

RHC = Right hypochondrium.

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Table (2): Clinical data of the patients

Clinical data	No. of patients	(%)
- Sex		
Female	254	90.7%
Male	26	9.3%
- Presentation		
Severe biliary colic and dyspepsia	154	55%
Mild biliary colic	84	30%
Dyspepsia	42	15%
- Ultrasonic diagnosis		
Calcular cholecystitis	238	85%
Non - Calcular cholecystitis	42	15%

No intraoperative deaths, occurred. In 4 patients (1.4%) procedures performed successfully through 3 trocars only without the lower lateral trocar (without assistant), intraoperative difficulties were encountered in 38 patients (13.5%), from them 6 patients (2.1%) were reverted to open cholecystectomy due to major difficulties that trials failed to complete it laparoscopically. 32 patients (11.4%) encountered varies difficulties that overcomed by some modifications and maneovurs. More than one difficulty may present in any patient (table 3 and 4).

10 patients (3.5%) showed difficulties in insufflation and trocars entry (table 5).

11 patients (3.9%) showed difficulties in grasping the gallbladder, 6 patients (2.14%) due to marked distention of the gallbladder, 2 patients (0.71%) due to impacted stone in Hartman's pouch, 3 patients (1.07%) due to perforation of the gallbladder from repeated grasping (Table 6).

Table (3): Course of the procedure

Direction of the procedure	No. of patients	(%)
- Procedures completed in ordinary direction	238	85%
- Procedures completed through 3 trocars	4	1.42%
- Intra-operative deaths	--	--
- Intraoperative difficulties	38	13.7%
* Cases reverted to open cholecystectomy	6	2.14%
*Procedures completed with some modifications and maneovurs	32	11.42%

Table (4): Patients were reverted to open cholecystectomy due to major difficulties.

Type of difficulty	No. of patients	(%)
- Marked dense adhesions due to previous major upper abdominal operations	2	0.71%
- Repeated collection of bile from the gallbladder bed (accessory duct)	1	0.35%
- dilated cystic duct with stone inside	1	0.35%
- Uncontrolled bleeding, in one case from mesenteric vessels and the other from cystic artery.	2	0.71%
Total number	6	2.14%

Table (5): Difficulties in insufflation and trocar entry.

Type of difficulty	No. of pts.	(%)	Actions
- Very thick abdominal wall (very fatty patient)	1	0.35%	Veress needle was inserted one inch. below the costal margin, just to the Rt. of the middle line
- Umbilical hernia	1	0.35%	Epigastric site was used.
- Minor bleeding from the infraumbilical trocar entry	1	0.35%	Compression of the bleeding site by lateral retraction of the trocar for 2 minutes was successful to stop bleeding.
- Previous infraumbilical incision	4	1.42%	Supraumbilical site was used in two cases. Rt. subcostal site was used in one case while Hasson's cannula (open approach) was used in one case.
- Minor bleeding from epigastric site of trocar entry	3	1.07%	Bleeding was controlled by traction on the adjustable stability thread in two cases while in one case a big bit stitch including the site of bleeding was mandatory.
Total number	10	3.57%	

Table (6): Difficulties in grasping the gallbladder.

Type of difficulty	No. of pts.	(%)	Actions
- Marked distension of the gallbladder	6	2.14%	Aspiration of the bile through the suction needle and grasping the gallbladder at the site of puncture were done.
- Impacted stone in Hartman's pouch	2	0.71%	* Dislodgment of the impacted stone by the 2 blades of an opened grasper was done (succeeded in one case) * In the other case, a non-ratched grasper was used to retract proximal to the pouch (at the begining of cystic duct.
- Perforation of the gallbladder due to repeated grasping	3	1.07%	* In one case, grasping a good part at the site of perforation was sufficient but in the other two cases, closure of the perforation by a loop of ligature was mandatory. * Suction of the escaped bile and administration of antibiotics was done
Total number	11	3.92 %	

15 patients (5.3%) showed difficulties in the exposure of the cystic duct and artery, 9 patient (3.2%) due to marked adhesions and the other 6 patients (2.1%) due to flappy ptosed liver Fig. (41), (Table 7).

19 patients (6.7%) showed difficulties in dissection of the cystic duct and vessels, 3 patients (1.07%) due to short cystic duct, 3 patients (1.07%) due to thick wall cystic duct with adhesions, one patients (0.35%) due to single stone in the cystic duct, 6 patients (2.14%) due to the presence of posterior cystic artery, 2 patients (0.71%) due to short cystic artery, 3 patients (1.07%) due to the prsence of loop of Henel, one patient (0.35%) due to branching cystic artery (table 8).

11 patients (3.9%) showed difficulties in dissection of the gallbladder from its hepatic bed, 8 patients (2.85%) due to perforation of the gallbladder, 3 patients (1.07%) due to bleeding from the bed (table, 9).

Table (7) : Difficulties in the exposure of the cystic duct and artery.

Type of difficulty	No. of Pts.	(%)	Actions
- Marked adhesions between mesocolon, stomach, abdominal wall and gallbladder	9	3.21%	Dissection by diathermy scissors near the wall of the gallbladder after good traction (the gallbladder towards the diaphragm by the lower lateral grasper and the adhesion bands gently to the opposite direction by the upper lateral grasper).
- Flappy ptosed liver	6	2.14%	*In 4 cases, the epigastric dissector (Maryland) was passed below the flappy lobe of the liver and was used as a retractor and dissector. * In 2 cases, a fifth trocar was inserted in the left subcostal site, and through it, a retractor was passed for elevation of the flappy liver.
Total number	15	5.35 %	

Table (8): Difficulties in dissection of the cystic duct and artery.

Type of difficulty	No. of Pts.	(%)	Actions
- Short cystic duct	3	1.07%	Dislocation of the neck of the gallbladder by diathermy scissors in both sides gives a range of mobility and clipping the duct near to the infundibilum.
- Thick wall cystic duct	3	1.07%	*Dislocation of the neck of gallbladder * Skletonization of the duct * Clipping of the duct by large clips (11 mm) succeeded in one case. * In the other two cases the size of clip was not sufficient, partial cutting of the duct between the clips and then clipping the remaining posterior portions.
- Single stone in the cystic duct	1	0.35%	*Gentle pushing it by the 2 blades of the opened dissector to the infundiblum
- Posterior cystic artery (injury occurred in the first 4 cases)	6	2.14%	*To avoid its injuery, we should expect its presence in each case * Careful dissection of the duct and its skletonization is important * Cutting of the duct between the clips snip by snip with scissors. * In injured cases, catching the injured site by the grasper, suction of the blood, then clipping of the injured artery
- Short cystic artery	2	0.71%	One clip was put proximally and the artery was diathermised distally and cut by diathermy scissors (near the gallbladder).
- Loop of Henel (Rt. hepatic artery formed a loop behind the cystic duct)	3	1.07%	It was mandatory to make sure that the cystic artery entered the substance of the gall bladder before its clipping .
- Branching cystic artery	1	0.35%	It was also mandatory to make sure that every branch entered the gallbladder before clipping it as usual.
Total number	19	6.78 %	

Table (9): Difficulties in dissection of the gallbladder.

Type of difficulty	No. of pts	(%)	Actions
- Perforation of the gallbladder	8	2.85%	* Could be avoided by good traction and countertraction * if occurred, suction of the escaped bile and parentral antibiotics was essential * grasping of the gallbladder from the site of perforation succeeded in 6 cases * in the other 2 cases, a loop of ligature was passed around the perforation site and tightened.
- Bleeding from the bed	3	1.07%	* Suction of the collected blood * Cauterization of the site of bleeding by diathermy succeeded to stop the bleeding in 2 cases, while clipping the bleeding site was done in the third case.
Total number	11	3.92%	

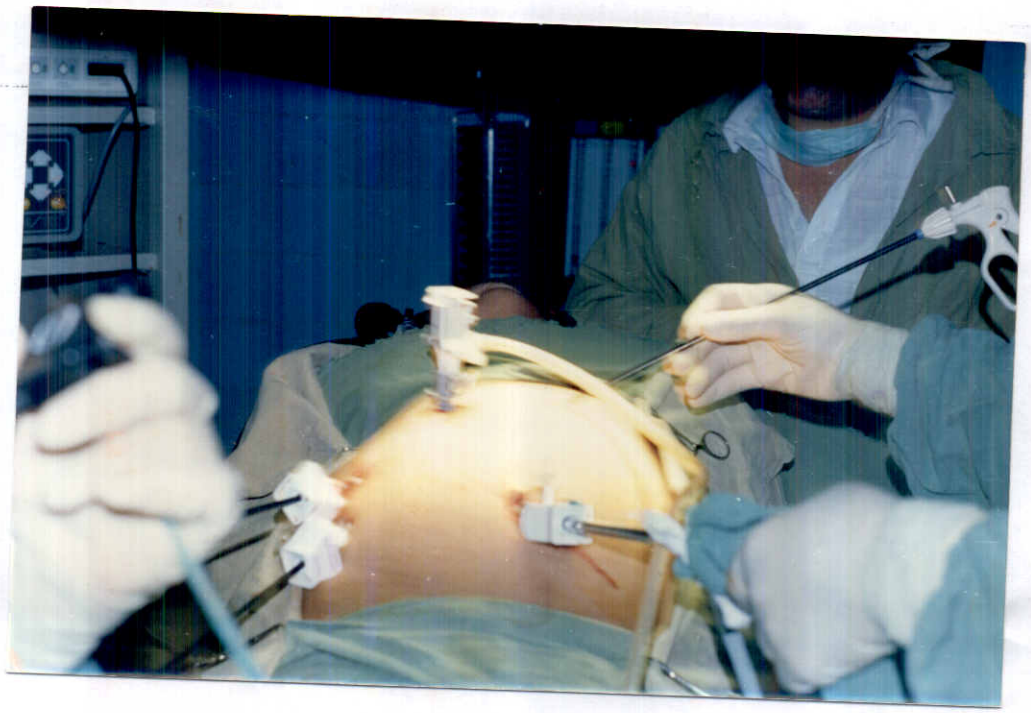

Fig. 41 : Site of the fifth trocar in ptosed flappy left lobe of the liver

13 patients (4.6%) showed difficulties during extraction of the gallbladder outside the abdomen, 8 patients (2.85%) due to multiple impacted stones, 5 patients (1.78%) due to the presence of a big stone (table 10).

Operative time (from the time of the incision for the Veress needle placement to the time of the skin closure) was an average of 42 minutes, the range was 25 to 100 minutes (table 11). Duration of the procedure decreased with an increasing experience of the surgical team and increased in the presence of difficulties.

Postoperative complications, were mostly minor and the table 12 representes these complications.

Almost of our patients were discharged home at the night of the operative day and only 6 patients (2.1%) were discharged home after 48 hours due to the presence of marked abdominal pain while, 4 patients (1.4%) were required to stay in the hospital for more than five days due to wound infections.

Table (10): Difficulties during extraction of the gallbladder.

Type of difficulty	No. of pts.	(%)	Actions
- Multiple impacted stones	8	2.85%	* In 6 cases, the infundibulum of the gallbladder was brought out and opened by a scalpel, then, the edges were caught by 2 or 3 artery forceps, a sucker was introduced inside it to evacuate the bile and stones were removed by stone forceps until its size becomes suitable for its removal from the skin incision * In 2 cases, widening of the incision was mandatory to extract the gallbladder with its content.
- Single big stone (more than 10 mm)	5	1.78%	* Crushing of the stone by stone forceps inside the gallbladder and extraction of its particles were succeeded in 2 cases. * In the other 3 cases, widening enough of the skin incision, rectus sheath and the peritoneum was mandatory for extraction of the gall bladder.
Total number	13	4.64%	

Table (11): Distribution of operations by the length of operative time.

Time in minutes	No. of patients	%
25 - 30	20	7.29 %
30 - 40	102	37.22 %
40 - 50	86	31.38 %
50 - 60	35	12.77 %
60 - 70	12	4.37 %
70 - 80	10	3.64 %
80 - 90	7	2.55 %
90 - 100	2	0.72 %

N.E : 6 patients (2.1%) reverted to open cholecystectomy

Table (12) : Post operative complications.

Type of complications	No. of pts	(%)
A) Early (first 48 hours)		
- abdominal pain	20	7.14 %
- repeated vomiting	5	1.78 %
- fever	3	1.07 %
- surgical emphysema	1	0.35 %
B) Late (after 48 hours)		
- Wound infections	4	1.42 %
- referred shoulder pain	4	1.42 %
- incisional hernia	1	0.35 %
Total number	38	13.57 %

N.E : Any patient may have more than one complication