# Results

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This work was performed on 500 patients with gall bladder disease, between May 1994 and December 1996. There were 332 women and 168 men ranging in age from 18 to 73 years.

Laparoscopic cholecystectomy was performed for acute cholecystitis in 35 patients and for chronic symptoms in 465 patients.

The overall Complications, were identified in 65 patients (13%).

- Operative complications 52 patients(10.4%).
- Postoperative complications 13 patients (2.6%).
- Serious complications requiring laparotomy one patient. (0.2%).
- There were no deathes recorded.

**Preoperative assessment :**

The results of history and clinical examination of these patients were shown in (Table 1.2). Duration of complaint varied from 4 months to two years with a mean of 14 months. Preoperative investigation have been done for all patients which are shown in (Table3).

Preoperative E.R.C.P was done for jaundiced patients (20 cases), with stones in common bile duct in 15 cases and stricture lower end common bile duct in 5 cases. For common bile duct stones successful endoscopic stone extraction was done. Upper gastrointestinal endoscopy was done in 40 patients and revealed 15 cases with normal findings , 17

cases revealed gastritis and duodenitis, and 8 cases with mild reflux oesophagitis , Oral cholecystogram was done for 15 cases who previously diagnosed with ultrasound as (gall bladder has thick wall but without stones,) then oral cholecystogram was done and revealed non functioning gall bladder in all cases (Table 3).

From the previous preoperative data most of cases (450 patients) were diagnosed as chronic calcular cholecystitis , others shown in (Table 4).

**Table (1) : History of five hundred patients prepared for laparoscopic cholecystectomy**

| History : | No. of patients | % |
|---|---|---|
| **(1) Present History :** | | |
| - Abdominal Pain | 455 | 91% |
| - Dyspepsia for fatty meal | 430 | 86% |
| - Vomiting | 85 | 17% |
| - Distension of flatulence | 235 | 47% |
| - Constipation | 96 | 19.2% |
| - Jaundice | 20 | 4% |
| - Fever | 40 | 8% |
| - Non specific | 85 | 17% |
| **(II) Past History :** | | |
| - Jaundice | 25 | 5% |
| - Abdominal operations | 60 | 12% |
| - Bilharziasis | 18 | 3.6% |
| - Previous similar attacks | 95 | 19% |
| - Chronic disease | 90 | 18% |

## Table (2) : Clinical Findings

| Clinical findings | No. of patients | % |
|---|---|---|
| *** General** | | |
| - Jaundice | 20 | 4% |
| - Fever | 40 | 8% |
| - Pallor | 25 | 5% |
| - Morbid Obesity | 90 | 18% |
| *** Local** | | |
| - Tenderness right hypochondrium | 455 | 91% |
| - Guarding right hypochondrium | 170 | 34% |
| - Murphy's sign positive | 315 | 63% |
| - Liver enlarged | 18 | 3.6% |
| -Scar of previous abdominal operation | 52 | 10.4% |
| -Abdominal para umbilical hernia | 10 | 2% |
| - Gall bladder mass | - | - |

## Table (3): Preoperative Investigations

| Investigations | No. of patients | % |
|---|---|---|
| **(1) Blood investigations:** | | |
| - Bilirubin (1.5-5) | 20 | 4% |
| - Alkaline phosphatase (200-360 mg/dl) | 25 | 5% |
| - High blood sugar (180-230 mg/dl) | 40 | 8% |
| - Low haemoglobin (9-10 gm%) | 10 | 2% |
| - High white blood count (7000-20.000) | 50 | 10% |
| **(II) Ultrasoudn result:** | | |
| - Gall bladder wall thick | 340 | 68% |
| thin | 160 | 32% |
| - Gall bladder distended | 70 | 14% |
| - Gall bladder contain multiple stones | 350 | 70% |
| Single stone | 135 | 27% |
| No stones | 15 | 3% |
| - Liver enlarged (fatty) | 60 | 12% |
| - Cirrhotic liver | 18 | 3.6% |
| -Common bile duct dilated: contain stones | 15 | 3% |
| - Others findings | 40 | 8% |
| **(III) ERCP** | 20 | 4% |
| **(IV) Upper G.I.T. endoscopy** | 40 | 8% |
| **(V) Oral cholecystogram** | 15 | 3% |

## Table (4) : Provisional Diagnosis

| Provisional diagnosis | No. of patients | % |
|---|---|---|
| - Chronic calcular cholecystitis | 450 | 90% |
| - Chronic non calcular cholecystitis | 15 | 3% |
| - Acute calcular cholecystitis | 35 | 7% |
| - Acute non calcular cholecystitis | - | - |
| - Additional Pathology | - | - |
| * Stones common bile duct | 15 | 3% |
| * Stricture lower end C.B.D. | 5 | 1% |
| * Hepatomegaly (fatty liver) | 60 | 12% |
| * Cirrhotic liver | 18 | 3.6% |
| * Splenomegaly | 15 | 3% |
| * Oesophageal varices | 5 | 1% |
| * Gastritis oesophagitis | 25 | 5% |
| * Abdominal hernias | 10 | 2% |
| * Other chronic diseases | 90 | 18% |

## Table (5) : Operative notes

| Operative Notes | No of patients | % |
|---|---|---|
| ***(I) Preoperative preparation with medication*** | 130 | 26% |
| ***(II) Antibiotics on induction of anasthesia*** (Cephalosporin Vial 1 gm I.V) | 500 | 100% |
| Additional antibiotics | 35 | 7% |
| ***(III) Position of patient :*** | | |
| - Separation both lower limb and camera man in between | 50 | 10% |
| - Usual position (Supin position) | 450 | 90% |
| ***(IV) Incisions :*** | | |
| closed technique - 3 puncture technique | 10 | 2% |
| - 4 puncture technique | 460 | 92% |
| - with Accessory port | 20 | 4% |
| - with Exploration (conversion ) Rt subcostal | 2 | 0.4% |
| open technique - with Abd .wall hernial repair | 10 | 2% |
| ***(V) Operative difficulties*** | 290 | 58% |
| ***(VI) Operative Complications*** | 65 | 13% |
| ***(VII) Redivac suction drainage*** | 2 | 0.4% |
| ***(VIII) Conversion (to open cholecystectomy)*** | 2 | 0.4% |

technique). The average operating time was 30 minutes (ranging from 15 to 70 minutes).

Two cases (0.4%) was converted to open cholecystectomy through right subcostal incision as shown in (Table 5).

**Operative difficulties :**

In our work Operative difficulties during laparoscopic cholecystectomy procedure involved about 17 different difficulties which was identified in 290 patients (58%) shown in Table (6).

There were 5 cases which had difficult insertion of Veress needle, which could not be introduced as there was history of previous repaire of para umblical hernia and there was possibility of mild intraperitoneal adhesions at umblical region which made introduction of the needle difficult. Manipulation of the needle away from adesions in a site remote from previous surgery (above and to the right of te umblicus ) so, Veress needle was introduced and pneumoperitoneum was created.

A technical problem had occurred in 5 cases due to shifting of umblical cannula above and to the right of the umblicus, so that position of umblical cannula was near from epigastric cannula so , manipulation of both during the procedure was difficult.

There were operative difficulties due to presence of umblical hernia which occurred in 10 cases leading to difficult insertion of Veress needle . In these cases open technique was carried out in which hernial sac was

**Preoperative preparation :**

Preoperative preparation with medication involved in 130 patients with chronic illness who admitted 2-5 days before operation to be controlled with medications which were either antihypertensives, insulin or, antibiotics, I.V. fluids and analgesics for acute attacks or biliary colics.

For all patients cephalosporin I gm vial was given on induction of anaesthesia (2 gm. in acute cholecystitis), also nasogastric tube and urinary catheter was applied to decompress the stomach and urinary bladder respectively to facilitate laparoscopic exposure of the abdomen and minimize the risk of injury of abdominal viscera and they were removed at the end of the procedure in all cases. All patients received general anaesthesia with controlled ventillation. Operating surgeon standed on the left side of the patients in 500 cases and camera man also in the left side of the patients on 450 cases and in between both lower limbs in 50 cases.

**Operative Technique :**

Laparoscopic cholecystectomy started through 3 puncture technique in 10 patients, 4 puncture technique in 460 patients and insertion of accessory port was done in 20 cases (closed technique).

Pneumoperitoneuim was created by using direct trocar insertion technique due to presence of scar of previous abdominal operation in 30 patients (closed technique).

In other 10 cases open Hasson Technique for pneumoperitoneum was done through hernial opening after dissection of the hernial sac (open

## Table (6) : Operative Difficulties

| Operative difficulties | No of patient | % |
|---|---|---|
| (1) Difficult insertion of verees needle | 5 | 1% |
| (2) Difficult due to umbilical hernia | 10 | 2% |
| (3) Adhesions around gall bladder (with omentum or intestines ) or mass | 45 | 9% |
| (4) Adhesion to abdominal wall | 15 | 3% |
| (5) Patient obese difficulties | 18 | 3.6% |
| (6) Liver enlarged | 36 | 7.2% |
| (7) Liver cirrhotic | 18 | 3.6% |
| (8) Hydrops Gall bladder (distended and tense) | 25 | 5% |
| (9) Gall bladder acutely inflammed and friable | 35 | 7% |
| (10) Empyema gall bladder. | 10 | 2% |
| (11) Difficult grasping gall bladder wall | 20 | 4% |
| (12) Adhesion around cystic pedicle | 25 | 5% |
| (13) Difficult identification cystic artery | 4 | 0.8% |
| (14) Abnormalities of cystic artery | 4 | 0.8% |
| (15) Difficult clipping of cystic duct . | 15 | 3% |
| (16) Position of cannulas near from each other so difficult manipulation | 5 | 1% |
| (17) Difficult dissection gall bladder from its bed | 15 | 3% |

dissected and excised then Hasson trocar was inserted with connection to insufflator for pneumoperitoneum.

Other operative difficulty was patient's obesity in 18 cases. There were 2 cases which had difficult insertion of Veress needle due to too much obesity. The limiting factor to gain access to the peritoneum was the thickness of the obdminal panniculus, with manipulation of the Veress needle, it was introduced and pneumoperitoneum was created. Also in these patients trocar placement was more difficult because of the thickness of the abdominal wall. In general, after access to the abdominal cavity was gained, obesity in the remaining 16 cases did not cause any additional difficulty unless the fatty enlargement of the liver.

There were 36 cases in which liver was enlarged, there was 18 cases with fatty liver, the liver was more friable and prone to injury during forceful retraction or by instruments inadvertently coming into contact with the hepatic capsule. Also retraction of the fundus of the gall bladder was difficult as the liver was enlarged , heavy and sagging down

In other 18 cases there was enlarged cirrhotic liver, the liver was stiff and heavy. For these reasons accessory fifth cannula was inserted to retract fatty omentum or enlarged liver in 15 cases of them .

Other types of operative difficulties were due to adhesions to anterior abdominal wall which occurred in 15 patients, 12 of them was due to previous abdominal operation and other 3 cases was just spontaneous adhesions . In all cases after laparoscopic access to the abdominal cavity

was gained safely either by inserting the initial trocar and sheath in a site remote from previous surgery or by using a direct cutdown on the peritoneum with placement of the initial laparoscopic sheath under direct vision. or by using direct trocar insertion technique. Adhenions that interfered with visualization was divided using standard sharp dissection techniques .

Other types of operative difficulties were due to adhesions around gall bladder which was common and occurred in 45 cases. These adhesions varied from few bands between gall bladder and omentum in 26 patients, easily dissected with illuminating dissector and with diathermy coagulation without any complications.

Adhesions may be moderate in extension which was found in 17 patients, dissection of these adhesions was performed with difficulties , associated with mild controllable bleeding in 2 cases. small perforation in gall bladder in 8 cases and small tear in liver in 2 cases . Remaining 5 cases dissection of adhesions was done safely without any complications

Adhesions around gall bladder may be extensive (early mas) which was found in two cases . These adhesions was densely adherent to different structures (omentum , intesstine, liver stomach , duodenum). There was difficulties on dissection of these extensive adhesions with blunt and sharp dissection with diathermy, and there was possibility of dangerous injury of vital structures , so these two cases with (early mass) extensive adhesions were converted to open cholecytectomy.

Post Bilharzial cirrhosis and portal hypertension was found in 18 patients. Coagulopathy resulted from depressed synthetic function of the liver led to controllable bleeding in 3 cases during dissection of the gall bladder from its bed and controllable bleeding from umblical port in two cases. Cirrhosis led to so stiff heavy liver that was difficult to elevate in a cephalad direction, thereby limiting visual exposure of the porta hepatis and gall bladder so, accessory fifth port was used to retract heavy liver in 10 cases, of them and to aid dissection of gall bladder which was deeply embeded in its bed in 9 cases, (intrahepatic gall bladder).

Other operative difficulties was occurred in 25 cases due to distended and tense gall bladder which was difficult to grasp and perforated in 7 patients with soiling of the peritoneum with bile which was sucked.

In the other 18 cases, the gall bladder was aspirated at first so, perforation did not occurr and straight forward dissection was then obtained.

Gall bladder was acutely inflammed in 35 patients, during dissection of these gall bladders, it was found that its wall was so friable and easily perforated with bile leak in 13 patient. Moderate controllable bleeding on touch was observed especially on dissection of gall bladder from its bed.

In 20 cases gall bladder was difficult to grasp its wall as in 6 cases it contains big hard stone involving almost all its lumen. In other 14 cases

gall bladder was tense, thick walled and contains one or more impacted srones in Hartman's pouch. In these cases gall bladder was aspirated which made them more easier to grasp .

Other operative difficulties were Adhesions around cystic pedicle which made dissection in this area very difficult, this was found in 25 patients. Two cases got small perforation in gall bladder neck during dissection of cystic pedicle, mild bleeding occurred in 3 cases during dissection of adhesions which was controllable.

In one case injury of the common bile duct during dissection of dense adhesions around cystic pedicle was occurred as a result of misidentification of the cystic duct . In the remaining 19 patients adhesions around cystic pedicle dissected safely with difficulty but without complications.

Difficult identification of the cystic artery occured in 4 cases. In 2 cases cystic artery was long and serpigenous vessel, it was identified, clipped and divided inbetween, In 2 cases difficult identification of cystic artery as it was surrounded by rough fatty peritoneal fold, identified cystic artery was clipped and cut .

In 15 cases difficult clipping of the cystic duct was found as it was short and very close to common bile duct (Sessile), successful clipping was done immediately below Hartmann's pouch in all cases .

Difficult Dissection of gall bladder from its bed occurred in 15 patients. In 5 cases had intrahepatic fibrotic gall bladder containing multiple stones led to difficult grasping of it, so bile was evacuated with aspiration and suction and stones removed from inside gall bladder one by one. In other 5 cases gall bladder was densely adherent to its bed which led to moderate bleeding during dissection, hemostasis done for it properly by clipping of bleeding posterior cystic artery in 2 Cases and cauterization of the bed in 3 cases . The remaining 5 cases gall bladder was dissected from its bed with difficulty but without complications.

**Operative complications :**

Operative complications were either due to laparoscopy or specific to cholecystectomy.

They happened in 52 patients who has various types of intraoperative complications, shown in table (7).

Intraoperative Bleeding was identified in 10 patients, it was of mild to moderate intensity and in all cases it was rapidly recognized and well contralled intraoperatively.

It was occurred due to trocar insertion or operative dissection of the gall bladder . The most common vascular injury sites were liver bed, epigastric vessels and cystic artery, respectively.

In our work the initial penetration of the abdominal cavity was carried out without any serious complications.

## Table (7) :Operative Complications

| Operative complications | No. of patients | % |
|---|---|---|
| **[1] Intraoperative Bleeding** | 10 | 2% |
| (1)From adhesions around gall bladder or around cystic pedicle . | - | - |
| (2) injury cystic vessels | 2 | 0.4% |
| (3)From Gall bladder bed during its dissection | 5 | 1% |
| (4) liver tear | 2 | 0.4% |
| (5) Site of ports | 3 | 0.6% |
| (6) Injury big vessles (Retroperitoneal vessel) | - | - |
| **[2]Gall bladder perforation with bile leak** | 32 | 6.4% |
| **[3] injury common bile duct** | 1 | 0.2% |
| **[4] Slipping clip of cystic duct.** | - | - |
| **[5]Socking site of extraction of G.B with bile and stones** | 9 | 1.8% |
| **[6] Intraoperative shock.** | - | - |
| **[7] Injury of duodenum.** | - | - |
| **[8] Injury of stomach.** | - | - |

Bleeding of minor intensity from the anterior abdominal wall at the puncture site during placement of epigastric trocar in 3 patients was observed which might be occurred due to injury of anterior abdominal wall vessels . In all cases bleeding was recognized through laparoscopy at the puncture site by noting blood dripping from the trocar site into the operative field, which was stopped in all cases spontaneously by compression with cannula.

Intraoperative moderate bleeding was identified in 5 patients during dissection of gall bladder from its bed 2 of them had liver tear. In all cases , patients were complaining of liver cirrhosis and portal hypertension and bleeding might be occurred due to coagulopathy or aberrant portosystemic venous collateralization in liver bed. In all cases prompt hemostasis was carried out to stop bleeding which was controlled by coagulation diathermy and placement of gel foams in liver bed.

Intraoperative bleeding due to injury of cystic vessels was occurred in 2 patients due to difficult identification of these vessels. In these cases moderate bleeding occurred due to injury of posterior branch of cystic artery , prompt clipping was carried out for bleeders, so they were well controlled, clots obscuring the operative field were cleared up by suction and laparoscopic cholecystectomy was completed safely without other complications.

Perforation of the gall bladder during laparoscopic cholecystectomy was the commonest complication, it was identified in 32 patients and it was insignificant especially in chronically inflammed gall bladders (10

cases) . In one patient perforation precluded successful completion of laparoscopic cholecystectomy together with presence of dense extensive adhesions between gall bladder, omentum, duodenum and colon (early mass). Perforation resulted in pus leaking outside which was cleared by suction (empyema of the gall bladder), further dissection of adhesions was very difficult, so judicious decision was taken to convert to conventional open cholecystectomy.

In 13 cases perforation occurred during dissection of gall bladder from surrounding adhesions, . Other 18 cases, perforation occurred during dissection of the gall bladder from its bed as it was either acutely inflammed with (distended and thin walled ) or firmly adherent to the liver bed or small fibrotic intrahepatic gall bladder . In all cases perforation was closed by grasper, bile leak or pus was cleared up by suction spilled stones were catched out by grasper.

Bile duct injury usually results from the misinterpretation of extrahepatic biliary anatomy. Confusion is most likely if the gall bladder infundibulum is pushed superiorly and medially, pulling the common bile duct out from behind the duodenum and into line with the cystic duct and gall bladder Other dissection errors resulting in bile duct injury include the failure to begin dissection on the gall bladder, routine dissection of the cystic duct all the way to the common bile duct, failure to identify anomalies of the cystic and hepatic ducts, failure to open all folds of the gall bladder infundibulum, and entrapment of a narrow common bile duct by a cystic duct clip (slid) too far proximally. ***(Hunter, 1993).***

Proper dissection strategy includes posterolateral traction on the gall bladder infundibulum and initiation of dissection at the most medial point where the gall bladder is clearly seen . ***(Hunter, 1993).***

In our work bile duct injury was the most common serious complication of laparoscopic cholecystectomy which occurred in one case, in which there was complete transection of common bile duct which was recognized intraoperatively as a result of misidentification of the cystic duct, probably due to upward distraction of the bile duct by the cephalad traction applied to the neck of the gall bladder . Common bile duct injury was indicated by unexplained leakage of bile into the operative field. Immediate laparotomy was carried out and common bile duct injury was identified and repaired by choledochoduodenostomy with placement of drain.

Socking site of extraction of gall bladder with bile and srones occurred in 9 cases due to forcible traction of gall bladder on extraction through a narrow epigastric port without usage of bag. These potentially infected sites were cleaned and disinfected by Bovidon iodine.

**Conversion Rate :**

Operative conversion from laparoscopic to conventional open cholecystectomy occurred in 2 patients (0.4%) conversion was carried out for two reasons, In the first patient conversion was done for safety (early mass) in which the anatomy could not be deciphered laparoscopically . In the second patient conversion was done by necessity (injury common bile duct).

Conversion done by necessity is that must be resorted to when a major event occurs during the procedure that cannot be treated laparoscopically.

**Postoperative care:**

Post operative care of patients was summerized in table (8) which involved analgesia giving immediately after recovery of patient in the form of pethidine 100 mg ampoul, giving for all patients. Other usual analgesia was also given for postoperative pain in the first few post operative days. Antibiotics in the form of cephalosporine were given for patients in first 2-5 days. Metronidazole was also given in combination with cephalosporine for 40 patients.
These courses were given as a prophylaxis measurement.

Oral feeding started in the first day postoperatively in 480 patients and delayed after this in 20 patients for possibility of early postoperative ileus and delayed activity of intestinal motility.

Patients discharged from hospital in the same day were 25 patient (5%) and in the first postoperative day in 450 patients (90%) and in the second postoperative day 15 patients (3%) and after that (3 -14days) in (2%) of patients.

Patients returned to normal activity within a week in 460 (92%) patients, within two weeks in 35 patients and within three weeks in 5 patients.

**Table (9) : Postoperative follow up**

| Postoperativefollow up | No. of patients | % |
|---|---|---|
| ** Complain* | | |
| Referred Right Shoulder pain (Ist 2 days) | 35 | 7% |
| Abdominal pain (1 st 2 days) | 125 | 25% |
| Vomiting | 15 | 3% |
| Distension | 23 | 4.6% |
| Fever | 8 | 1.6% |
| Cough | 5 | 1% |
| Ecchymosis Abdominal wall | 2 | 0.4% |
| Wound discharge | 2 | 0.4% |
| Late complain | 5 | 1% |
| **Clincial picture:* | | |
| Tenderness | 125 | 25% |
| Distension | 30 | 6% |
| Fever | 8 | 1.6% |
| Wound discharge | 2 | 0.4% |
| S.C hematoma | 2 | 0.4% |
| Late manifestation | 5 | 1% |
| **Investigation :* | | |
| Abdominal U/S | 14 | 2.8% |
| Intraperitoneal collection | 1 | 0.2% |
| -X- ray abd (erect ,supine) | 2 | 0.4% |
| Blood investigations | 40 | 8% |

## Table (10) :Postoperative Complications

| postoperative Complications | No of patients | % |
|---|---|---|
| [1] Intraperitoneal collection | 1 | 0.2% |
| [2] postoperative fever | 8 | 1.6% |
| [3] subcutaneous haematoma of abdominal wall | 2 | 0.4% |
| [4] Intestinal obstruction | - | - |
| [5] Wound infection | 2 | 0.4 |
| [6] Incisional paraumbilical hernia | - | - |

Intraperitoneal biliary collection diagnosed in one case from the third day post operatively who developed abdominal pain, vomiting constipation and distenrion, clinically they had tenderness, mild guarding all over the abdomen with distension, sluggish bowel sound and was associated with high fever 38C, normal levels of serum liver enzymes. Investigations done revealed high W.B.Cs (900-1400) plain x-ray abdomen erect and supine showed multiple fluid levels , and ultrasound revealed free collection in subphrenic spaces and pelvis patient was treated conservatively with I.V fluids analgesics, antipyretics and antibiotics for one week .

Post operative fever happened in 8 patients , one case developed fever (37.5C° - 38C°) for two days, this fever may be due to intraoperative perforation of the gall bladder during its dissection from its bed and leakeage of pus as it was acutely inflammed (pyocele), during the operation the pus was sucked but there may be some intraperitoneal remnant of pus which may cause postoperative fever. Another case got postoperative fever (37.5c - 39c) from the first day post operatively and lasting for 5 days. Ultrasound was done which revealed intraperitoneal free collection, the condition subsided under conservative treatment (antibiotics and antipyretics for one week).

In other two cases, Fever about 38C° was developed from the second day and may be due to subcutaneous hematoma which was present.

There were 2 patients developed subcutaneous hematoma of abdominal wall at the third postoperative day, patients developed

subcutaneous hematoma in the form of ecchymosis abdominal wall. around umblicus and in flanks which was painful , management was done conservatively by a giving analgesia and antibiotics .

Two cases developed postoperative wound infection. One case developed after one week postopertively. serosanginous discharge from epigastric port wound which was treated conservatively and subsided after 4 days . the gall bladder was remored from epigastric port which soil the wound with infected bile . Asecond case developed wound infection at umbilical port with serosanginous discharge at the 10 the port operative day. condition treated conservatively then subsided after 5 days.