



TO ASSESS AND EVALUATE THE CHANGE IN DIAMETER OF COMMON BILE DUCT BEFORE AND AFTER THE SURGERY

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ABSTRACT Common bile duct dilatation in post-cholecystectomy condition continues to be a matter of great controversy. Our aim was to determine the magnitude of common bile duct (CBD) dilatation in patients after cholecystectomy, followed up for a period of 1 year.

Aims and objectives: To assess and evaluate the change in diameter of common bile duct post-cholecystectomy.

Material and methods: This study was conducted in Maharishi Markendeshwar Medical College and Hospital, Kumarhatti Solan and a total of 100 patients were included in the study.

Inclusion criteria :- All patients admitted in Maharishi Markendeshwar Medical College and Hospital, Kumarhatti Solan for cholecystectomy procedure were included in the study.

Exclusion criteria:- Patients with severe co morbid conditions were excluded from the study.

Conclusion:- Mild dilatation of common bile duct was seen post-operatively in most cases of cholecystectomy. Asymptomatic bile duct dilatation of up to 10 mm can be considered as normal range in patients after cholecystectomy. However a CBD dilatation of more than 3 mm above the baseline was seen in some patients.

KEYWORDS : Cholecystectomy, Common bile duct, Dilatation, Ultrasound

Introduction

Gall stones and sequelae associated with them have been documented since ancient times, however most of the advances in the treatment and diagnosis of these conditions has been made in the last century.

The earliest records mentioning the liver and biliary tract date to around 2000 BC. The gallbladder, the cystic, hepatic and common bile ducts were described by Babylonians. The earliest known gall stones date back to the twenty first Egyptian dynasty (1085-945 B.C.) having been discovered in the mummy of a priestess of Amen. Ironically, this ancient specimen was destroyed in the bombing in England during World War II (Nahrwold, 1994).

Later on, in the time of the Romans Empire, the rare anomaly of double gall bladder was first described by Pliny. Soranus of Ephesus, a well known physician of his time first described jaundice and the associated signs of extrahepatic biliary obstruction, including acholic stools, dark urine, and itching. Gall stones were first described in the 5th Century by a Greek Physician, Alexander Trallianus, (525-605 AD), who wrote about calculi within the bile ducts. The surgical relevance of biliary tract disease was first made obvious by the Islamic Physician Ibn Sine (980-1037 AD) who stated that a biliary cutaneous fistula could occur as a sequelae of drainage of an abdominal wall abscess.

Gentile de Fokingo, Professor of Medicine in Padua in 1341, reported a human gall stones as one of his autopsy findings. Antonia Benivieni (1440-1502) described a large black calculus in the gall bladder of a woman (Glenn, 1971). In 1559 Colombo found gall stones in the body of St. Ignatius, founder of the Jesuit order.

The surgical intervention in gall bladder disease originated in the 17th century A.D. with the works of Joenisius (1676) who first extracted gall stones through a biliary fistula that had formed from spontaneous drainage of an abdominal wall abscess. Jean Louis Petit (1674-1760) noted that a gall bladder could become adherent to the abdominal wall and proposed that it be punctured through the wall of the abdomen by a trocar. The first cholecystostomy is credited to John Stough Bobbs, in Indianapolis of June 15, 1867. He operated upon a 32 year old patient.

Ultrasound has emerged as a diagnostic imaging method of choice for

liver and extrahepatic biliary system. It provides detailed anatomical information with high resolution and great flexibility. Structure details down to a millimeter are available. Real time imaging and viewing of changing structure is a characteristic feature of ultrasound. Direct (operative, transhepatic, endoscopic retrograde) cholangiographic dimension are affected by volume and pressure of injection, while indirect (intravenous) cholangiography is affected by time delay and contrast used. On the contrary, sonography clearly provides a completely physiologically noninvasive means for delineating duct anatomy. The biliary system is ideal for ultrasonographic evolution in that the acoustical impedance of bile is significantly different from surrounding structures.

Although stones may be easily missed on ultrasound, the size of the common hepatic duct can be measured quite easily. In this study ultrasound has been made investigating tool for measuring CBD diameter before and after cholecystectomy.

The liver is a complex organ which performs many metabolic functions. The biliary tract is the excretory system of the liver and includes intrahepatic and extra hepatic biliary duct system. Any liver disorders will influence extra hepatic biliary system and vice versa. Any pathology of this system may alter anatomical architecture and biochemical processes. Clinician tend is to refer to all biochemical determinations that reflect hepatic diseases, as "liver function tests". Only some of them however, actually measure hepatic function, for example the estimation of the ability of the liver to excrete an endogenous load (e.g. bilirubin) is indeed tests of liver function. Measurement of the ability of the liver to synthesize albumin also measures hepatic function. These biochemical tests are of great help in the recognition of hepatic diseases and any extrahepatic biliary disorders. These include measurement of blood constituents that, when elevated, reflect hepatocyte injury or biliary tree impatency. Serum activity of several enzymes (aminotransferases [transaminases], ornithin carbomoyl transferase etc) iron, ferritin and vit B12 are elevated in patients with hepatic necrosis, to a degree that may assist in diagnosis. Conversely, the levels of other enzymes (alkaline, phosphatase, 5'nucleotidase etc) cholesterol, trihydroxy bile acids and lipoproteins are elevated to a diagnostically helpful degree in patients with biliary tree obstruction. An important physiologic role of the liver

is the removal from blood of potentially noxious endogenous and exogenous substances, and, thereafter, excretion into the bile or conversion to products suitable for excretion by the kidney or lung. Measurements of the concentrations of some of these endogenous substances in the blood, urine or feces, or of the rate of uptake and excretion of exogenous substances, provide useful tests of hepatic function. So important biochemical determinations have been made an integral part of this study.

Aims and objectives:

To assess and evaluate the change in diameter of common bile duct before and after the surgery

Material and methods

This study was conducted in Maharishi Markendeshwar Medical College and Hospital, Kumarhatti Solan, Himachal Pradesh, and a total of 100 patients were included in the study.

Inclusion criteria :-

All patients admitted in Maharishi Markendeshwar Medical College and Hospital, Kumarhatti Solan for cholecystectomy were included in the study.

Exclusion criteria:-

Patients with severe co morbid conditions were excluded from the study

OBSERVATIONS

The present study included hundred patients admitted to the department of Surgery of Maharishi Markendeshwar Medical College and Hospital Kumarhatti Solan.

Age and Sex

In this study, there were twelve patients i.e. 12% (ten females and two males) in the age range of 21 -30 yrs.

Thirty two patients ie. 32%(twenty-six females and six males) were in the age range of 31-40 years.

Thirty-eight patients i.e. 38% (thirty females and eight males) were in the age range of 41-50 years.

Twelve patients i.e. 12% (nine females and three males) were in the age range of 51-60 years.

Four patients i.e. 4% (three females and one male) were in the age range of 61-70 years.

Only two patients (male) fell in the age range of 71-80 years.

The youngest of the patients was 21 years female and the eldest of the patients was 77 years male. The arithmetic mean, median and the mode of the ages were 43.08, 42 and 45 years respectively. Out of the total of fifty patients, 22 were males and 28 were females depicting a male female ratio as 1:3.5.

Gallbladder disease (Cholelithiasis) was well represented between the age range of 31-50 years as 70% (i.e. 70 out of 100) of the patients belonged to this age range. There were 12 females and 6 males of the mean age 62.77 (age range 52- 77 years) showing that male - female ratio became 1:2 with advancing age.

In most of the patients (62%) the duration of illness was within one year, but in a few (10%), the complaints could be traced back to more than three years.

Mild to moderate pain over the right hypochondrium was the commonest (92%) of the symptoms. Flatulent dyspepsia was complained by 66% patients. Vomiting and fever was present in 20% and 6% of the patients respectively.

With regard to biochemistry, 94 patients had serum bilirubin levels <2.8% i.e. normal range . 6 patients had serum bilirubin levels more than normal upper limit. Of these six patients, 4 had serum bilirubin marginally raised above 2.8 mg%. But in these patients all other liver function tests (i.e. serum alkaline phosphatase SGOT, SGPT and serum proteins) were within normal range and ultrasonography showed no liver and extrahepatic biliary disorder.6 patients (6%) had

CBD diameter more than 7 mm pre-operatively.

Operative Procedure:

The operative procedure carried out was cholecystectomy in all the patients. The common bile duct was not explored in any case.

Follow-up:

All the patients were followed up regularly for a period of 1 year after the operation. Ultrasound examination for Preoperative Mean diameter of fifty patients was 4.12 mm. 94 (94%) of the patients had common bile duct diameter between 2-7 mm pre-operatively which is a normal range of CBD diameter on ultrasonography. Only 6 (6%) had CBD diameter more than 7 mm preoperatively.

For 10 cases upper GI endoscopy was done. Four were having gastric ulcers and six were having simple gastritis for which treatment was given. Two patients presented with dyspepsia who were found to be having associated hiatus hernia. Six patients who presented with indigestion were treated by enzyme preparation. Postoperative mean diameter of the hundred patients at one week follow up was 4.75 mm.

The difference between mean preoperative and mean postoperative (1 week follow up) diameter was found to be 0.63 (p<0.001) mm which is highly significant. Post operative mean diameter of the hundred patients at one month follow up was 5.14 mm.

The difference between mean preoperative and mean postoperative (1 year follow up) CBD diameter was found to be 1.02 mm (p<0.001) which is highly significant . 8 patients whose CBD diameters were rather decreased were not taken into account.

Unpaired "t" test was used to calculate standard error. The P value came out to be <0.01 and result is highly significant . Cholecystectomy patients whose CBD diameters were rather decreased were not taken into account. 92 patients (range 32~77years) showed common bile duct dialation of the order of 3 or more than 3mm after one month of cholecystectomy . 8 patients whose CBD diameters were rather decreased were not taken into account. Unpaired "t" test was used to calculate standard error. The P value is highly significant.

Discussion

This study was conducted among 100 otherwise normal subjects belonging to the state of Himachal Pradesh. 22 males and 28 females of age range of 21-80 years were included in the study. The subjects underwent ultrasonographic measurements of common bile duct diameters by experienced radiologist at Maharishi Markendeshwar Medical College and Hospital Kumarhatti Solan. In addition, biochemistry test results were obtained for each of the study subjects.

The mean diameter observed in our study was 4.51 mm preoperatively and 5.14 mm post operatively with a standard deviation of 1.01 mm and mean difference between pre-operative and postoperative CBD diameter was 0.63 mm . This was similar to that reported by Parulekar in his study on 200 normal subjects. Mesenas et al., reported a higher mean diameter of 5 mm (SD 1.9 mm). In a study in Korea, Park et al., reported the average diameter of the common bile duct was 6.7 mm. Other studies have reported lower mean diameters at less than 4 mm .

The lower and upper limits of normal common bile duct diameter were found to be 2.0 mm and 7.9 mm respectively in our study. However, majority of the study subjects (94%) in our study had a common bile duct diameter of <6 mm. The upper limit was similar to that reported in a study by Behan et al., wherein 8 mm was recommended as the upper limit for common bile duct diameter. However, the upper limits of normality for common bile duct diameter have been reported variably by several studies. A much lower upper limit at 5 mm has been reported by some studies . In a study by Dewbury the range of measurements in all patients was from 2 mm to 5 mm. He therefore recommended the upper limit to be 6 mm. Among 750 adult subjects, Bruneton et al., found only 5.9% of to have a bile duct with a diameter greater than or equal to 5 mm. However, a high 10 mm as the normal upper limit for common bile duct diameter was reported by Wu CC et al.,

The mean common bile duct diameters of proximal and distal parts were 4.0 mm (SD 1.02 mm) and 4.2 mm (SD 1.01 mm), respectively. A strong correlation was found between proximal and distal part of CBD due to constant diameter. Similar correlation has been reported by Adibi and Givechian and Niederau et al.

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