
Review Articles

Iatrogenic Bile Duct Injury What And When?

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ABSTRACT

A prospective study of patients with iatrogenic bile duct injury (IBDI) on what to do and when to do; over a period of one year at a tertiary health care center.

AIMS AND OBJECTIVES :

1. A compilation of various presenting scenarios of patient with IBDI.
2. Modalities of investigation.
3. When and how to intervene.

MATERIALS AND METHODS :

Over a period of one year, 20 patients with iatrogenic bile duct injury were divided into two categories – one, those who were diagnosed intraoperative and second, who were diagnosed after 24 to 48 hours. Patients in second category were further subdivided into those who underwent immediate intervention and those who were kept conservative for 8-12 weeks and operated on after that.

These patients were assessed on various clinical, biochemical and radiological parameters like vitals, per abdomen examination, hemogram, liver function tests, ultrasound, MRCP, ERCP and CECT.

RESULTS :

Out of 20 patients, only 2 patients were diagnosed to have IBDI intraoperative, t-tube placement done in one and in another the proximal end was tied.

Out of the other 18 – 2 presented with biliary peritonitis and had to be re-explored.

The other 16 were stable and could be kept conservative till 3 months following which a delayed attempt at bilio-enteric reconstruction was given with a uneventful post operative course.

CONCLUSION

Intraoperative diagnosis is difficult in cases of IBDI but after 24-48 hours – prompt intervention in patients with developing biliary peritonitis and delayed intervention in stable patients with close follow up of their clinical course is crucial in preventing IBDI related mortality and morbidity.

INTRODUCTION

Iatrogenic bile duct injury is a rising problem due to increasing trend in laparoscopic cholecystectomy.

The most frequent cause of IBDI is misidentification of the bile duct as the cystic duct; in cases of anomalies of cystic duct insertion into common hepatic duct. Such misidentification of biliary anatomy before clipping, ligating and dividing structures predisposes to IBDI.

FACTORS INCREASING RISK OF IBDI

- Anatomical anomalies in bile duct and hepatic arteries and its misidentification.
- Inflammation around gall bladder and hepaticoduodenal ligament.
- Bleeding from surgical area
- Obese patient
- Excessive dissection along the common bile duct margins causing damage to three and nine o'clock pericholedochal arterial plexus.

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According to literature, distal IBDI are accompanied by damage of axial arteries (10-15%) and proximal IBDI are usually associated with damage to hepatic artery and its branches (40-60%).

AIMS

- A compilation of various presenting scenarios of patient with IBDI.
- Modalities of investigation.
- When and how to intervene

MATERIALS AND METHODS

- STUDY DESIGN – prospective study
- STUDY GROUP – Over a period of one year, 20 patients admitted in civil hospital; operated for cholecystectomy within or from outside were included in the study.
- There were 12 females and 8 males.
- Inclusion criteria – Patients operated for cholecystectomy with postoperative bile leak into drain or peritoneum.
- Exclusion criteria – Bile leak due to other causes like trauma and other surgeries.
- Strasberg – Bismuth classification was used to classify the level of bile duct injury.

RESULTS

The presenting complain that led to diagnosis of IBDI i.e., bile leak from drain or main wound, biloma, biliary peritonitis, cholangitis and obstructive jaundice were recorded for each patient.

Time of diagnosis –

1. During cholecystectomy
2. Postoperative –
 - 2A. Within first 48-72 hours.
 - 2B. After 48-72 hours.

PRESENTING COMPLAINS

Two patients were diagnosed with bile duct injury intra-operatively.

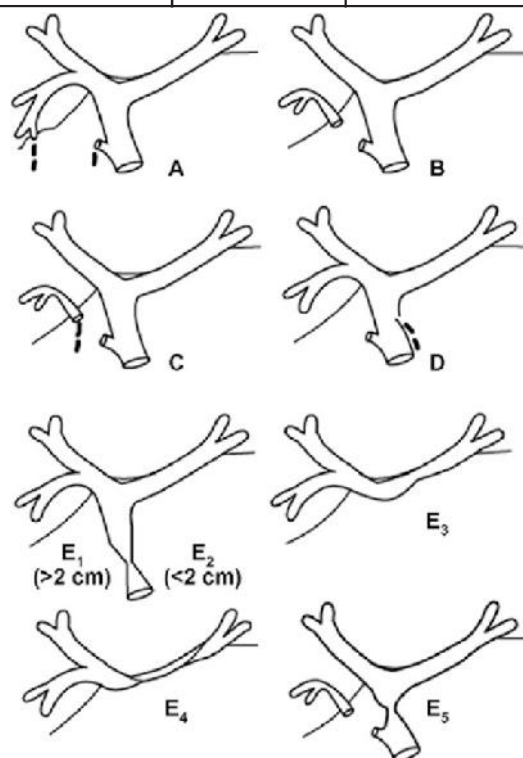
Two patients were diagnosed after they developed biliary peritonitis.

Ten patients had bilious output in drain and seven patients developed obstructive jaundice.

MANAGEMENT – 1

Out of the two patients who were suspected to have intra-operative bile duct injury –

TYPE/LEVEL OF INJURY	NO. OF CASES (20)	PERCENTAGE
A	2	10%
B	4	20%
C	0	0%
D	2	10%
E1	1	5%
E2	6	30%
E3	4	20%
E4	1	5%



In one patient, drain placement was done followed by ERCP stenting within 48 hours.

In second patient, T – tube was placed but patient had to undergo ERCP with stenting the next day.

MANAGEMENT – 2 A

Two patients presented with biliary peritonitis and had to be explored.

One patient was explored within 48 hours – multiple drains were placed and patient could be salvaged.

Another patient presented on post op day 4 – laparotomy was done with multiple drain placement with feeding jejunostomy but could not be saved.

MANAGEMENT – 2 B

16 patients along with 1 who had survived laparotomy were monitored daily on basis of –

1. Vital parameters like temperature, pulse rate, blood pressure, respiratory rate and air entry.
2. Per abdomen findings like distention, tenderness or guarding, peristalsis.
3. Development of signs of obstructive jaundice like passage of clay coloured stool, icterus and pruritus.
4. Biochemical markers like hemogram and liver function tests.
5. Ultrasound was serially done at monthly interval or according to symptom of patient to monitor presence or absence of collection, biliary tree – size and level of cut off, echotexture of liver.
6. ERCP was attempted in 2 patients but had failed.
7. MRCP was done and used as a main guideline for plan of management.
8. Decision was taken to operate this patients after the bile leak had stopped, proximal duct had dilated to at least 1.5 cm, there was no collection and patient had been built up nutritionally but before patient started developing liver cirrhosis.
9. This was usually between 2-3 months following surgery.

OPERATIVE TECHNIQUE OF BILE DUCT DISSECTION AND ROUX-EN-Y HEPATICO-JEJUNOSTOMY RECONSTRUCTION

- Extra hepatic biliary tree was explored upto confluence and even beyond according to level of injury.
- Satisfactory bleeding from the cut end was ensured.
- Roux loop of jejunum was transferred to upper abdomen via transverse colon.
- Single layer duct to mucosa hepatico-jejunostomy was performed with absorbable suture material vicryl or PDS – 3-0 or 4-0.
- Drain was placed in all patients.

CONCLUSION

Intraoperative diagnosis is difficult in cases of IBDI but after 24-48 hours – prompt intervention in patients with developing biliary peritonitis and delayed intervention in stable patients with close follow up of their clinical course is crucial in preventing IBDI related mortality and morbidity.

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