MANAGEMENT OF BILIARY FISTULAS

Dr T.K. Marumo

University of Witwatersrand and CMJAH



Issues

- Definition
- Severity assessment
- Risk factors
- Early Diagnosis
- Appropriate investigations
- Management

Definition

- Bile leakage is of fluid with an elevated bilirubin level in the abdominal drain or intra-abdominal fluid on or after Post-operative Day Three
- Or the need for radiological intervention (i.e. interventional drainage) owing to biliary collections or re-laparotomy due to biliary peritonitis.
- The elevated bilirubin level in the drain or intra abdominal fluid is defined as a bilirubin concentration at least three times higher than the serum bilirubin level measured at the same time.

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Severity Assessment

- Grade A.
 - Bile leakage requiring no or little change in patients' clinical management
- Grade B.
 - Bile leakage requiring a change in patients clinical management (e.g. additional diagnostic or interventional procedures) but manageable without a re-laparotomy. OR: a Grade A bile leakage lasting for > 1 week

• Grade C.

Bile leakage requiring re-laparotomy

Table 3 Univariate and multivariate analysis (adjusted and unadjusted (RR with 95% CI) of selected clinically important variables associated with the occurrence of bile leakage

Variables	%	Unadjusted RR (95% CI)	P-value	Adjusted RRª (95% CI)	<i>P</i> -value
Laparoscopic resection (No, Yes)	5.9, 7.4	1.25 (0.47–3.33)	0.65	-	_
Intra operative ablation (No, Yes)	7.6, 3.0	0.39 (0.10–1.57)	0.19	-	_
Synchronous primary resection (No, Yes)	7.2, 8.5	1.18 (0.49–2.82)	0.71	-	_
Portal vein embolization (No, Yes)	7.0, 9.4	1.35 (0.73–2.49)	0.34	-	_
Pre-operative chemotherapy (No, Yes)	7.7, 6.8	0.89 (0.56–1.40)	0.60	-	_
Vascular reconstruction (No, Yes)	6.8, 16.3	2.38 (1.16–4.88)	0.02	1.04 (0.45–2.37)	0.93
Klatskin tumour (No, Yes)	6.5, 21.7	3.33 (1.82–6.07)	<0.001	1.29 (0.57–2.92)	0.54
Colorectal liver metastases (No, Yes)	9.5, 5.6	0.58 (0.37–0.92)	0.02	0.94 (0.54–1.63)	0.82
Liver fibrosis (No, Yes)	6.6, 14.5	2.18 (1.20–3.97)	0.01	1.47 (0.76–2.84)	0.25
Liver steatosis (No, Yes)	8.7, 4.3	0.49 (0.27–0.89)	0.02	0.59 (0.31–1.13)	0.11
Blue liver (No, Yes)	7.6, 4.7	0.62 (0.26–1.51)	0.29	0.78 (0.31–1.97)	0.61
Drain used (No, Yes)	1.2, 10.8	9.32 (3.43–25.37)	<0.001	9.92 (3.12–31.57)	<0.001
Intra-operative blood loss (ml)					
Less than 150	1.7	_			
150 to less than 300	2.8	1.62 (0.46–5.66)	0.45	1.66 (0.47–5.85)	0.43
300 to less than 600	8.4	4.88 (1.68–14.11)	<0.01	4.32 (1.47–12.69)	<0.01
600 and more	14.0	8.13 (2.94–22.49)	<0.001	6.18 (2.13–17.89)	<0.001
Extent of resection					
1 segment or less	4.9				
2 or 3 complete segments	6.0	1.21 (0.59–2.51)	0.60	1.08 (0.52–2.24)	0.84
4 complete segments ^a	7.9	1.61 (0.77–3.37)	0.20	1.00 (0.48–2.06)	0.99
More than 4 segments	10.3	2.10 (1.08–4.08)	0.03	0.87 (0.42–1.78)	0.70
Re-resection (No, Yes)	6.7, 10.9	1.63 (0.94–2.85)	0.08	1.37 (0.77–2.45)	0.29

^aEach risk factor was adjusted for with all of the other risk factors listed in the table. RR, relative risk; CI, confidence interval.

Risk factors for biliary leaks

- Varies according to type of surgery
 - Liver resection
 - Hepatholithiasis
 - Cholidocholitiasis
 - Pancreatic surgery
 - Gallbladder surgery

RISK FACTORS FOR BILE LEAKS FOLLOWING CHOLECYSTECTOMY

- Emergency surgery
- Incomplete or disrupted closure of cystic duct
- Wide and very inflammed cystic duct
- Presence of bile duct stones









PREVENTION OF BILE LEAKS

- Appropriately identify and secure cystic duct
- Avoid clip dislodgement
- Endo loop usage
- Avoid duct avulsion
- Be cautious when making use of cautery
- Appropriate plane of dissection

RISK FACTORS FOR BILE LEAKS AFTER EXTRAHEPATIC BILIOENTERIC ANASTOMOSIS

- Bile leaks occurs in 5,6%
- Preoperative chemoradiation
- Simultaneous liver resection
- Re-operation after liver transplant
- Low pre-operative albumin????

PREVENTION OF BILE LEAKS AFTER BEA

- Well vascularised bile duct
- Tension free anastomosis
- Absence of cholangitis
- Intraluminal stenting????
- Access loop???

RISK FACTORS FOR BILE LEAKS AFTER LIVER RESECTION

- Independent RF
 - intra operative blood loss>600mls
 - use of intraoperative drains
- Cirrhosis
- BMI ??
- Multivisceral resection ???
- Intraoperative haemodynamics ????











PRINCIPLES OF MANAGEMENT OF BILIARY FISTULAS

- Control of the leak externally
- Control of Systemic Sepsis
- Define anatomy
- Reconstitution of biliary continuity

 Management of post operative biliary fistulas has changed from aggressive surgical strategy to an aggressive, less invasive strategy in which interventional radiology plays a crucial role.

CONSERVATIVE TREATMENT

- Antibiotics
- Appropriately placed perioperative drains
- Serial Radiological imaging

MINIMALLY INVASIVE THERAPIES

- Percutaneuos approach
 - Percutaneuos transhepatic biliary drainage(PTBD)
 - Percutaneuos pigtail insertion
 - Percutaneous transhepatic biliary emblosclerosis(SPECIALISED UNITS ONLY)
 - Percutanoeus internal ,external biliary drainage
 - Rendzevorous technique

Endoscopy

- Sphincterotomy
- Sphincterotomy and transpappilary stenting
- Sphincterotomy and nasobiliary drainage
- E/S, stenting and fibrin glue insertion