First Week:

Diagnosis:

Q 1. Does X-ray abdomen help in initial presentation?

Answer: Yes, all patients with acute abdominal pain should have a x-ray abdomen in erect and supine position to rule out perforation peritonitis and acute intestinal obstruction.

Management:

Q 2. What is the role of NG tube aspiration in acute pancreatitis.?

Answer: No role for routine NG aspiration. Indications for NG aspiration are:

(i) Intra-abdominal hypertension
(ii) Persistent paralytic ileus
(iii) Repeated vomitings.

Q 3. Oxygen supplementation guidance/ goals?

Answer: Minimal O_2 supplementation to maintain O2 saturation >90%.

Q 4. When should the days be calculated? From the first onset of pain or admission?

Answer: From onset of pain

IV Fluids:

Q 5. I have not seen many patients who can tolerate 200 ml/hour (4.8 L in 24 hour) without developing fluid overload. What is your experience?

Answer: Yes, most patients will require 3-4 litres of fluids. More than that can lead to problems of overload.

Q 6. Is there any evidence that pancreatitis destined to be severe can be converted to mild or moderate with adequate fluid therapy?

Q 7. If patient presents in first 48 hours, are there any strategies to prevent progression to severe acute pancreatitis other than IV fluids?

Answers: No. Because it is the out of proportion inflammatory response that leads to severe AP. But theoretically yes and a few observational studies have shown less chances of necrosis after adequate fluid resuscitation. But no RCT has documented it. No other pharmacological strategy is successful as of now.

Q 8. What should be the fluid management in AKI, CKD, heart failure, CAD or elderly patients?

Answer: Obviously, one has to be very careful in judiciously using the amount of IV fluids in such patients. The best way is to have periodic check points. This means that every 6-8 hours one should check for signs of fluid overload such as increase in respiratory rate, B-

lines on chest USG, increased CVP if it is in place, or sometimes even crepts in the chest on auscultation.

Q 9. What is the criteria to know increased fluid on Lung Ultrasound and IVC measurement?

Answer: B lines on lung USG is suggestive of fluid overload. In most centres, lung USG is available in the ICU.

Two parameters are taken in to account: 1. maximum IVC diameter: If it >2 cm, it is likely that the patient has euvolemia or fluid overload. 2. IVC collapsibility: It is the ratio of difference in max. and min. IVC diameter/minimum IVC diameter. If it is high (>40-50%), the patient has hypovolemia. If it is low <20-30%, the patient has hypervolemia.

Q 10. What is the CVP cut off for fluids administration?

Answer: In general, CVP is a poor guide but if a CVP line is in place, maintain it around 12 cm of water.

Q 11. Do you give glucose rich fluid and how to maintain glycemic control?

Answer: In general, RL is preferred for the first 2-3 days. Later, if you are giving dextrose, you should maintain blood sugar between 150-180 mg/dL. Tight glycemic control is not recommended in sick patients.

Analgesics:

Q 12. Are opioid safe as an analgesic in biliary pancreatitis?

Answer: There is no study that has specifically looked at biliary pancreatitis but we did not find any problem in our patients. The reason is that a small stone causes pancreatitis when it is stuck at the ampulla and most of the time it passes out in 48-72 hours.

Q 13. What is the dose of pentazocine (Fortwin)?

Answer: It is 30 mg 8 hourly.

Q 14. Can we use Tramodol?

Answer: Yes, it is an effective analgesic.

Q 15. Can we sue both opiate and diclofenac?

Answer: In general, it is not required but one can do so if required.

Q 16. What is the role of Octreotide?

Answer: There is no proven role of octreotide or somatostatin.

Q 17. What is the role of Ulinastatin?

Answer: There is no proven role of Ulinastatin in acute pancreatitis. We need more RCTs to answer this question.

Nutrition:

Q 18. What are the indications of keeping patient NPO in initial 1- 2 days?

Answer: In general, keeping nil by mouth helps in control of pain. That is why most guidelines suggest starting enteral (oral/tube) feeding once the pain starts subsiding which happens in 2-4 days.

Q 19. What is the role of immune enhancing formulae as nutrition supplementation?

Answer: There is no proven role of such formulae.

Q 20. In paralytic ileus, how early to start enteral feed?

Answer: In general, one can wait for a few days. But if it persists, one should start enteral feeding very gradually and see how the patient tolerates it. Sometimes, nasojejunal feeding may be tried. But if the patient does not tolerate i.e. develops repeated vomitings or increased pain or abdominal distension, it should be stopped. In those rare situations, TPN may be given if the patient has not been receiving calories for a week or so.

Q 21. What is polymeric nutrition?

Answer: Normal diet or milk/curd based liquid feeds for tube feeding.

Q 22. Is hypotension contraindication for enteral feeding?

Answer: Yes, if a patient is requiring vasopressors for maintaining blood pressure, enteral feeding should be withheld.

Role of anticoagulants:

Q 23. What is the role of Heparin in acute pancreatitis?

Answer: In general, there is no guideline for using heparin to prevent necrosis or portal/splenic vein thrombosis. Patients who are in ICU and require prolonged hospitalization should be given prophylactic LMWH as in any other critical illness.

Q 24. If a patient develops acute portal vein thrombosis in ANP without bowel ischaemia, should we give anticoagulation?

Answer: It is a difficult decision. But it might be prudent to start heparin under careful observation.

Q 25. What are the common drugs to cause acute pancreatitis?

Answer: L-asparaginase, Azathioprine, Mesalazine, Fenofibrate, Thiazides, and Valproic acid are commonly associated drugs.

Antibiotics:

Q 26. If there is associated cholangitis, what is the role of antibiotics?

Answer: Yes, antibiotics should be started.

Q 27. If a patient is already on antibiotics, what to do next?

Answer: If the antibiotics have been started only for 2-3 days in the first week of illness, we tend to stop it otherwise we continue.

Q 28. Is there a need to obtain culture sample before starting antibiotics?

Answer: Yes, blood, urine, sputum/BAL, catheter fluid culture should be obtained in the beginning and periodically.

Q 29. What is the role of CD64 in necrotising pancreatitis?

Answer: CD64 is a receptor present on neutrophils. CD64 positive neutrophils are increased in the presence of bacterial infection. We have completed a study and found that it may be helpful in suspected infected necrosis. But it needs validation and moreover the test (FACS) is not available at most places

Q 30. When to use antifungal?

Answer: Anitfungals should be used (i) if a fungal culture is positive and (ii) if sepsis in not getting controlled despite adequate antibiotics and drainage.

Q 31. What is the choice of antifungals?

Answer: It depends on culture report. If it is not available, we generally use caspofungin.

Q 32. What is role of CT in first 48-72 hours?

Answer: Only if the diagnosis is in doubt.

Q 33, Should a CT scan be done in every case of mild pancreatitis?

Answer: No. CT is not required in majority of patients with mild pancreatitis.

Q 34. If the creatinine is increased, can a plain CT be sufficient?

Answer: it depends on the indication. If the idea is to rule out alternate diagnosis such as bowel perforation or to look for the presence, size and location of a fluid collection, then it may be helpful.

Q 35. How often do we need to repeat cross sectional imaging?

Answer: It depends on the clinical course. In general, a repeat CT is required to assess response to drainage or when it is to be determined if additional drainage is required.

Role of EUS

Q 36. What is role of EUS?

Answer: There is no role of EUS in the beginning of the illness. Later, it is required for EUS guided drainage or to find out the etiology of AP such as microlithiasis or occult tumour.

Etiology of AP:

Q 37. What is the pathophysiological basis of increased transaminases in acute biliary pancreatitis?

Answer: When a small CBD stone gets stuck at the lower end of the bile duct at the ampulla, it causes biliary obstruction and thus the LFT becomes abnormal. Once the stone passes out, LFT normalises.

Q 38. In post cholecystectomy patients can we consider microlithiasis as a cause of acute pancreatitis?

Answer: Yes, it could be a cause of pancreatitis because these patients have lithogenic bile. If one can demonstrate abnormal LFT during acute pancreatitis, it is a strong indicator of biliary etiology.

Q 39. What is level of serum ALT for diagnosing biliary pancreatitis?

Answer: Usually the cut off is 150 IU but even a lower level may be important if it comes down quickly.

Q 40. Can pancreatic edema in first 3 days cause deranged LFT by compression on CBD?

Answer: Yes, it can but it takes a few days. In biliary pancreatitis, it will be abnormal in the first 24 hours.

Q 41. In a non-alcoholic patient with first attack of mild acute pancreatitis with USG finding of gallbladder sludge with normal LFT, normal calcium and triglyceride, what should be plan for gallbladder?

Answer: GB sludge by itself is unlikely to be the cause of pancreatitis unless the LFT is abnormal. It is advisable to repeat USG periodically for the next 3-6 months to see if small gallstones develop.

Q 42. How to interpret deranged LFT in an alcoholic patient having gallstones and acute pancreatitis with regard to etiology?

Answer: Three points suggest biliary cause: (i) the level of ALT usually >150, (ii) ALT more than AST, and (iii) quick normalization of LFT

Q 43. is there any correlation between amount of alcohol consumption and diagnosis of alcohol related pancreatitis particularly in patients with non- significant (social) amount of alcohol consumption without any other apparent cause. Should we call them alcohol related pancreatitis?

Answer: No, social alcohol drinking does not cause acute pancreatitis. So, one must keep looking for a definite etiology. Particularly in elderly persons, one should rule out occult tumours. However, the patient must be advised against alcohol use after recovery because individual susceptibility to alcohol may vary.

Q 44. Is the diagnosis of idiopathic acute pancreatitis common now-a-days with wider availability of EUS and MRCP?

Answer: Yes, it is still around 25-30% and most of these patients have genetic mutations and at risk of recurrent acute pancreatitis. The diagnosis of microlithiasis is often wrong. One has to see the LFT in the first 24-48 hours. EUS and MRCP are helpful in diagnosing occult tumours in patients with AP who are >50 years of age.

Role of ERCP:

Q 45. If the USG shows a dilated CBD with a doubt of CBD stone with abnormal LFT, what should be done?

Answer: It depends on the LFT. If it is improving one should wait till the patient improves. After the patient improves, one should make sure the stone is still present before ERCP.

Q 46. If there is an impacted stone at the lower CBD, what should be done?

Answer: ERCP may be required if you are sure of the diagnosis and the patient is stable to undergo ERCP.

Q 47. What is the time to intervene for pancreatic duct leak (ERCP and stent)?

Answer: There is no proven role of ERCP and PD stenting in acute pancreatitis for pancreatic duct leak.

Q 48. If ERCP is being done for CBD stone, does PD standing also help in same setting in reducing complications?

Answer: If the guidewire has gone into PD then one can place a small diameter pancreatic stent otherwise one should not try to stent the PD intentionally. A recent RCT has shown increase in complications following attempted ERCP and PD stenting in an effort to reduce pancreatic ductal leak in acute pancreatitis.

Q 49. Is ERCP only effective within 72 hrs or any time if there is suspicion of cholangitis?

Answer: ERCP should be done anytime, if there is acute cholangitis.

Q 50. In a case of recurrent acute pancreatitis (4-5 times in 2 months) with cause being microlithiasis or cholelithiasis, will you consider putting a prophylactic CBD stent?

Answer: First of all, recurrence of pancreatitis should be diagnosed after 2-3 months of recovery from AP. If a patient has recurrent pain 4-5 times in the first 2 months, it is because of complications such as fluid collections. An EUS will help to rule out microlithiasis. ERCP should not be done without documenting CBD stone.

Q 51. A patient had cholecystectomy 10 years ago. She now developed choledocholithiasis induced AP. Should we place stent while doing ERCP or only stone removal?

Answer: Only stone should be removed after a good sphincterotomy.

2nd week and beyond:

Drainage for Collections:

Q 52. What is the role of drainage in first 2 weeks in persistent organ failure or suspicion of infected collection?

Answer: One should give antibiotics and wait for 1-2 weeks more till the illness enters 3rd or 4th week. If however, CT scan shows a well-defined fluid collection and the patient is not improving with antibiotics, the collection should be drained,

Q 53. Can a radiologist do transbowel percutaneous drainage?

Answer: No. The bowel should be carefully avoided. Sometimes, percutaneous transgastric drainage can be done if there is no other route.

Q 54. Is USG guided drainage acceptable?

Answer: if the collection is large and a recent CT scan is available for guidance, then it can be done.

Q 55. If there is significant ascites during second week how to proceed?

Answer: The ascites should be drained with the help of a pigtail catheter.

Q 56. If there is fever but no fluid collection. What to do?

Answer: Fever may be due to pancreatitis per se in the first week of illness. Later, one should look for other causes of fever and treat accordingly. Sometimes, the patient may have antibiotic associated fever.

Q 57. If a patient has increasing counts without fever with MODS, should we drain?

Answer: Yes, if there is a drainable fluid collection.

Q 58. If CT guided percutaneous drain in not feasible, can EUS guided therapy be done in 2nd week?

Answer: No. In some patients who develop a well-defined wall around the collection, one can do EUS guided drainage in the 3rd week and beyond but one has to be an expert experienced endoscopist.

Q 59. In the first 2 to 3 weeks, if the patient is deteriorating, should we drain percutaneously or endoscopy?

Answer: Percutaneously in most situations.

Q 60. What is the percentage of necrotic debris in a collection to define whether it's a WON or pseudocyst?

Answer: By definition, a pseudocyst should have no necrotic debris. <30% is taken as minimal debris.

Q 61. What size of PCD catheter should be used to drain the collection? Should multiple PCD be placed in a same collection?

Answer: Usually 12-16 F size catheter is placed initially. It depends on the size of collection, route available, and the experience of the radiologist.
No, multiple catheters are generally not placed in the same collection.

Q 62. What is waiting time from percutaneous drainage to surgical necrosectomy ?

Answer: It depends on the clinical situation. In general, surgery should be done after at least 4 weeks from onset of AP. One should wait for a minimum of 1-2 weeks to assess response to PCD and antibiotics.

Q 63. How to manage pericatheter leak, even after upsizing the PCD ?

Answer: It generally means either a blocked catheter or smaller size catheter compared to the drain site. First take care of these problems. A colostomy bag can be placed around the catheter and the catheter should be brought out by making a hole in the bag.

Q 64. What is the checklist before selecting patients for endoscopic drainage?

Answer: the following should be ensured:

(i) Proper indication for drainage
(ii) An experienced endoscopist
(iii) Stable patient
(iv) Pre-procedure anesthesia work-up
(v) A recent CT scan should be done to assess the collection and associated complications such as venous thrombosis and pseudoaneurysm.
(vi) Collections in the lesser sac with <1 cm distance between the gastric wall and the collection.
(vii) Normal coagulation profile
(viii) Pre-procedure antibiotic
(ix) Check the EUS scope
(x) Check all the required accessories
(xi) Pre-procedure USG if the CT scan was done many days earlier
(xii) Surgeon should be informed upfront for managing any procedure related complications

Q 65. Do you need to rule out pseudoaneurysm every time before drainage?

Answer: Ideally yes but a CT angio is generally not required unless there is a history of bleeding or drop in hemoglobin.

Q66. When should we place a metal stent or plastic stent and which one?

Answer: If the necrotic debris is >30% of the collection, then a metal stent is better. LAMS is better than SEMS. In patients with minimal debris or pseudocyst, 2 plastic stents should be placed.

Q 67. When and how should be we do lavage?

Answer: Lavage should be done if the sepsis does not respond or the patient develops new onset fever. Lavage should be done with sterile normal saline. We have stopped doing lavage with H_2O_2 because of suspicion that it caused peritonitis in a few cases.

Q 68. How and when should feeding be done after LAMS?

Answer: Oral feeding can be resumed a day after the procedure.

Q 69. When should the LAMS be removed?

Answer: It should be removed by 2-3 weeks.

Q 70. Can we remove the metal stent, as early as 5 days post stenting, if necrosectomy is complete?

Answer: Yes

Q 71. How to prevent SEMS migration in patient with post cystogastrostomy?

Answer: LAMS usually does not migrate. One should be very careful during necrosectomy to prevent migration. Adherent necrotic debris should not be removed forcibly.

Q 72. Do we have to stent the PD in pseudocyst/WOPN and when?

Answer: No. In most cases, PD stenting is not required.

Q 73. Should a nasocystic tube be placed?

Answer: We generally do not place a nasocystic tube because of its small size. It may help in some patients for lavage if sepsis does not resolve.

Q 74. What is the difference between pancreatic duct disruption and disconnected pancreatic duct?

Answer: In patients with necrotizing pancreatitis, necrosis may involve pancreatic duct leading to its disruption. Subsequently, the duct heals with fibrosis leading to stricture and a disconnected duct.

Q 75. Should PD stent be placed for disconnected duct?
Answer: In most cases, it is not required and is not possible due to late presentation.

Special type of pancreatitis:

Q 76. Is there a role of Plasmapheresis?

Answer: Its role has only been tested in Hypertriglyceridemia related pancreatitis. It is still experimental. Insulin infusion can also be tried in hypertriglyceridemia related acute pancreatitis.

Q 77. What is the management approach to traumatic pancreatitis?

Answer: In most situation, surgical treatment is indicated in severe grade of injury. Milder grade of injury can be treated with conservative treatment. Management of associated other organ injury is very important. ERCP is generally not indicated in the acute setting.

Intra-abdominal hypertension:

Q 78. What is the method for detecting Intra-abdominal hypertension?

Answer: The standard method is to measure intra-urinary bladder pressure.

Q 79. What are the indications for IAP Monitoring?

Answer: In patients with abdominal distension, tense abdomen, and deteriorating clinical condition, IAP should be measured.

Q 80. How frequent is abdominal compartment syndrome (ACS) and how often do they need decompressive laparotomy?

Answer: ACS may be seen in 20-30% of patients with severe acute pancreatitis. Decompressive laparotomy is rarely done because the outcome is not good.

Follow up:

Q 81. During follow up of patients of necrotizing pancreatitis, how aggressive we should look for diabetes or exocrine deficiency?

Answer: Exocrine insufficiency is mostly asymptomatic and most do not require treatment., But blood sugar must be monitored carefully at regular intervals.

Cholecystectomy:

Q 82. What is the timing of cholecystectomy in a case of biliary pancreatitis?

Answer: In mild acute pancreatitis, it should ideally be done in the same hospital admission. In those with moderate and severe pancreatitis, it should be done after 6-8 weeks after careful assessment of the need for intervention for fluid collections.

Q 83. Does cholecystectomy prevent recurrence of idiopathic pancreatitis?

Answer: No.

Miscellaneous Questions:

Q 84. Is there any role of steroids in preventing the severe pancreatitis?

Answer: No

Q 85. Does probiotic worsen pancreatitis?

Answer: Yes, it may worsen. One RCT was stopped midway due to increased mortality.

Q 86. Is there a role for antioxidants?

Answer: No

Q 87. How to differentiate between post-ERCP pancreatitis and a minor post sphincterotomy leak (no retroperitoneal air but retroperitoneal small collection) with pain and increased amylase and lipase.

Answer: If there is no air and amylase and lipase are increased, it should be taken as post-ERCP pancreatitis. Even in small leak, retroperitoneal air must be present in the beginning.

Q 88. What is the role of chest physiotherapy and incentive spirometry?

Answer: These must be practiced in all patients with severe acute pancreatitis.

Q 89. What is the role of lactate as a predictor? And how frequently we should repeat it?

Answer: It has a role in monitoring sepsis but not as a predictor of severe pancreatitis.

Q 90. In a patient with carcinoma pancreas presenting as acute pancreatitis, if patient has obstructive jaundice requiring drainage, which approach is preferred, ERCP or PTBD?

Answer: ERCP is preferable.

Q 91. Can we diagnose autoimmune pancreatitis in Acute Pancreatitis

Answer: Type 1 autoimmune pancreatitis, does not present with acute pancreatitis. Type 2 autoimmune pancreatitis, which is uncommon, may sometimes present with acute pancreatitis. The diagnosis can be made on follow up.

Q 92. In a patient with massive intraperitoneal hemorrhage what should be done in a setting of failed embolization?

Answer: Surgery should be done.