

HISTORY PRESENT



1. Name : Dr HIRALAL KAUL
2. Qualification : MBBS; MD; FRCA
3. Last worked at : ALL INDIA INSTITUTE OF MEDICAL SCIENCES, ND
4. Years in service : 1971 - 2004
5. Years of Retirement : MARCH, 2004
6. Date & Place of Birth : 27th March, 1942, Srinagar, Kashmir
7. Schooling from : Srinagar, Kashmir
8. What made you opt for the medical stream : Interest in Biology
9. MBBS Year of & college : 1959, Srinagar Medical college
10. PG Year of & Institute : 1968, AIIMS, ND
11. Did you become an anesthetist by choice : YES
12. Extra Academic interest : Photography
13. Special person you'd like to remember : Col. G.C Tandon, Prof & HOD, AIIMS, ND
14. Special interest in sub specialty of Anaesthesia :
 - a) Pediatric & Neonatal Anaesthesia
 - b) Critical Care Medicine
15. Teacher you were most inspired by. WHY : Col. G.C Tandon. He was a visionary, philosopher and a great teacher
16. Teacher you were most in awe of : None
17. Professional experience, College/Hospital : Anaesthesia practice from 1966-2004, AIIMS, ND
18. Your first PG student : Dr. Vidyamurthy Kasthala
19. Your most memorable Student : Many
20. When did you become the HOD? : 1988
21. Your aim (special objective) as HOD : To make the Dept a model for others to follow
22. Did you achieve it? : Let history speak
23. Anything you want to change, now that you look back? : Very little
24. How do you spend your time now? : Practice anaesthesia as a HOBBY
25. Any special hobbies? : COOKING
26. Is there a change in the work culture from your times? : Yes, significant. Earlier we used to work for the department. Now everybody works for him/herself
27. Message to the young anesthesiologist : Work hard, work sincerely & above all-be competitive
28. Your hope for the future : Anaesthesia as a specialty has a bright future
29. Would you advise your grand children to become doctors/anesthesiologist?
 - a. If already doctors, : Yes
 - b. Will not advise any good student to become a doctor : It is a waste of time and talent

ANAESTHESIA FOR LIVER TRANSPLANT

Dr Ranju Gandhi, Associate Consultant, Dr Subhash Gupta, Senior Consultant, Dr Jayashree Sood, Senior Consultant & Chairperson, Department of Anaesthesiology, Pain and Perioperative Medicine, Sir Ganga Ram Hospital. E-mail icu_era@yahoo.co.in*

Liver transplant (LTP) is the sole definitive treatment for patients with end stage liver disease (ESLD) resulting from varied etiologies such as alcohol, hepatitis B and C, cryptogenic, autoimmune, biliary atresia, metabolic diseases, drug/toxin induced and selected cases of hepato cellular carcinoma. Absolute contraindications to LTP include extra hepatic malignancy, cholangiocarcinoma, active untreated sepsis, advanced cardiopulmonary disease, active alcoholism or substance abuse and anatomic abnormalities precluding transplant. Liver is procured from a cadaveric or living donor.

Currently, the rate limiting step for transplantation is cadaveric organ availability. This has led to increasing number of living donors. The scarcity of ideal donors and growing waiting lists, have forced the transplantation community to liberalize donor criteria. Introduction of MELD (Model for End Stage Liver Disease) score, an objective score derived from 3 parameters; bilirubin, prothrombin time (PT) and creatinine, ensures that organs are allocated to sickest patients with greatest risk of mortality. PELD (Pediatric End Stage Liver disease) score is calculated from bilirubin, INR, serum albumin, age less than 1 year, and evidence of growth failure. Potential recipients and donors are well screened for their eligibility for LTP by a multidisciplinary team comprising transplant surgeon, hepatologist, cardiologist, chest physician, psychiatrist and anesthesiologist.

Preanaesthetic evaluation (PAE) of potential recipient includes a thorough systemic assessment. **History** of jaundice, ascitis, ascitic tap, haematemesis, endoscopy, ligation of varices, sclerotherapy, bleeding PR, spontaneous bacterial peritonitis (SBP), hepatic encephalopathy, hepatitis A, B, C, D, E, diabetes mellitus, hypertension, coronary artery disease, hypo/hyperthyroidism, asthma, COPD, renal dysfunction, previous surgery, exercise tolerance, alcohol and smoking.

Treatment history: Albumin, diuretics (spironolactone, frusemide or combination), H₂ blockers, propranolol, FFPs, Platelets, Vitamin K, antibiotics, lactulose or medications for other co-morbidities.

Physical Examination : Weight, height, nutrition, mental status, icterus, oedema, lymph nodes, ascites, clubbing, JVP, pulse, BP, respiratory rate, SpO₂, hepatosplenomegaly, auscultation of breath and heart sounds and airway assessment.

Investigations : Complete blood count, blood group, liver function tests (total and conjugated bilirubin, AST, ALT, ALP, total protein, albumin, GGT, PT, INR, APTT), BUN, serum creatinine, Na, K, Ca, Mg, PO₄, blood sugar, creatinine clearance, DIC profile (FDP and fibrinogen), viral studies [HbsAg, AntiHBV, HCV RNA, AntiHCV, HIV 1 and 2, CMV (IgG and IgM)], T₃, T₄, TSH, ABG, Cultures (blood, urine, ascitic fluid [cell count], pleural fluid), Chest X ray, Pulmonary function tests, ECG, Echo, stress Echo, [contrast (Bubble) Echo for intrapulmonary shunts], ammonia level and thallium scan if indicated.

Modified Child Turcotte-Pugh (CTP) Score

Parameters	1	2	3
S.Albumin (g/dl)	> 3.5	2.5-3.5	<2.5
PT	< 4 s of control	4-6 s of control	> 6 s of control
S.Bilirubin (mg/dl)	< 2	2-3	> 3
Ascites	Absent	Slight-moderate	Tense
Encephalopathy	None	Grade I-II	Grade III/IV

*Class A = 5,6 points, Class B = 7 to 9 points, Class C = 10 to 15 points

CTP score and MELD score are useful tools to predict perioperative morbidity and mortality in cirrhosis patients. Many studies show MELD to be superior to CTP in predicting intermediate and long term survival.

Hepato-pulmonary syndrome (HPS), Hepato-renal syndrome (HRS) and Porto-pulmonary hypertension syndrome (PPS) are unique complications that may be seen in patients with ESLD that require special care. In contrast to PPS, HRS and HPS recover after LTP.

Preparation and optimization of LTP recipients - After the initial screening, sicker patients are admitted to ICU. Pulmonary infections are treated, hypoxemia is corrected by oxygen therapy or ventilatory support. Dyselectrolytemia and nutritional deficiencies are corrected by enteral or parenteral supplementation. Ascites is controlled by paracentesis and judicious use of diuretics.

PT is returned to near normal by FFP transfusion and vitamin K injection. Treatment of encephalopathy (management of cerebral edema), SBP (antibiotics) and HRS (albumin, terlipressin, octreotide) instituted. Continuous renal replacement therapy (CRRT) is started in patients with renal failure and is continued perioperatively. At least 10 units PRBCs, FFPs, 3 units cryoprecipitate, single donor platelet apheresis and platelets are arranged and availability confirmed from blood bank.

Goals in cadaveric donors (certified brain dead) - Correct hypovolemia, hypotension, maintain systolic BP > 100mmHg (mean 70-110 mm Hg), $pO_2 > 100$ mmHg, urine output >1-1.5ml/kg/hr, Hb > 10gm/dl, CVP 5-10 mm Hg, Glucose < 200 mg/dl

Anaesthetic management of living donor- In contrast to cadaveric, living LTP is done on an elective basis. An important presurgical consideration is volumetry (Triphasic CT scan) for determination of mass of transplanted liver that is needed to support a given patient and to leave enough liver mass with the donor. Graft-recipient body weight ratio should be between 0.8-1.5. Surgery is usually right hepatectomy, sometimes left hepatic lobectomy or left lateral segmentectomy and lasts for 6-12 hours. Donors are ASA PS 1 or 2 and given standard care as in a major laparotomy. In addition to standard ASA monitoring, arterial BP, CVP, urine output, serial ABG, glucose and Hb is monitored. A low CVP is desirable during hepatic resection to minimize bleeding but has attendant risk of air embolism and hypotension. Donors's trachea are mostly extubated on table and are monitored closely in ICU. Postoperative analgesia is provided with epidural or IV PCA.

Anaesthetic management of recipient-

After OT and drugs are prepared, patient is wheeled to OT and placed on gel blanket on warmed mattress. Standard monitors (ECG, NIBP, SpO_2) are attached. Using strict aseptic precautions, radial artery is cannulated under local anaesthesia for sampling and pressure monitoring and is connected to Lithium dilution cardiac output monitoring or Pulse contour cardiac output monitoring. Baseline thrombelastograph (TEG) is done.

At our hospital, anaesthesia is induced with iv midazolam, fentanyl, thiopentone sodium and rocuronium, trachea intubated and ventilation adjusted to maintain $EtCO_2$ between 30-35 mm Hg. Rapid sequence induction is done if surgery is emergent or significant ascites is present. Care of eyes and pressure points is taken. Right IJV is cannulated with two wide bore multilumen catheters (7F and 9.5F with a PAC introducer). PAC (Pulmonary artery catheter) is used at the discretion of anaesthesiologist. CVP monitoring is instituted. Ryle's tube inserted (caution in presence of oesophageal varices), urinary bladder is catheterized and connected to urometer. Some centres use Transesophageal echocardiography (TEE).

Two infusion lines are set up with Hotline fluid warmers and Rapid infusing system is kept ready. Two forced air warming blankets are used for upper and lower body to maintain normothermia. Anaesthesia is maintained with isoflurane (preserves splanchnic blood flow better than other agents) in oxygen and air mixture along with titrated fentanyl and rocuronium infusion. Cisatracurium and remifentanyl are preferred if available. Volatile agents are avoided or used cautiously in low concentrations in recipients with fulminant hepatic failure and cerebral edema. In case of hypotensive episodes, one may have to discontinue volatile agents and use midazolam with minimal haemodynamic effects.

Coagulation defects : Quantitative and qualitative platelet defects, decreased synthesis of clotting factors and their inhibitors, vitamin K deficiency, synthesis of abnormal clotting factors, decreased clearance of activated factors, hyperfibrinolysis and DIC may be present.

Perioperative management of coagulation is guided by TEG, PT and platelet count. Institutional guidelines vary. In the OT, TEG coagulation analyzer guides replacement of blood components and pharmacological agents. Transfusion trigger: Platelets if count

< 40,000/cu mm or decreased maximum amplitude, FFPs if INR > 1.5 or prolonged reaction time, cryoprecipitate if hypofibrinogenemia or fibrinolysis or clot formation rate less even after platelet transfusion, antifibrinolytics (tranexemic acid or EACA) during fibrinolysis (clot lytic studies). Recombinant factor VIIa (r VIIa) is used at some centres, but has doubtful efficacy. Plasmapheresis with replacement therapy (removes filterable coagulation inhibitors) is done in patients with fulminant hepatic failure. Blood loss is replaced with PRBCs to maintain Hb > 9 gm/dl. Maintain normothermia, normal acid-base balance and treat ionized hypocalcemia.

Intraoperative serial measurement of ABG, TEG, blood glucose, Hb and hourly urine output is done along with beat to beat haemodynamic monitoring. Anaesthesia is tailored to meet requirements of three stages in liver transplant surgery.

Dissection phase from skin incision to occlusion of hepatic artery and portal vein. Hypovolemia due to drainage of ascites is treated in anticipated fashion with colloid containing fluid (4% albumin). Hypocalcemia and hypomagnesemia is corrected. Avoid aggressive treatment of hypokalemia. Bleeding can be due to preexisting coagulopathy, severe portal hypertension, past SBP and adhesions from previous surgery.

Anhepatic phase from occlusion of hepatic artery and portal vein until reestablishment of portal inflow to the liver. Crossclamping of suprahepatic and infrahepatic vena cava (IVC) decreases venous return by 50%. May require inotropic support. Venovenous bypass or "piggy back technique" is used to circumvent decreased venous return. Hepatectomy is followed by haemostasis and vascular anastomosis of supra and infrahepatic IVC and portal vein. Fibrinolysis may begin during this phase.

Mannitol is given for prophylaxis against acute renal failure (ARF). It is an osmotic diuretic, flushes necrotic cellular debris, reduces endothelial cell swelling and a free radical scavenger.

N-acetyl cysteine (NAC), an antioxidant, a free radical scavenger has beneficial effect on ischemia reperfusion injury that occurs in LTP and helps preserve and improve function of newly implanted liver, the infusion is continued into postoperative period.

Immunosuppression with iv methyl prednisolone 10 mg/kg is given in all patients and Hepatitis B immunoglobulin is administered in HbsAg positive patients.

Neohepatic phase from portal vein inflow to closure of abdomen. Reperfusion of new liver through portal vein can be associated with abrupt increases in potassium and hydrogen, an abrupt increase in preload and decrease in SVR and BP requiring calcium and bicarbonate infusions. Hepatic arterial anastomosis and biliary reconstruction is performed after venous reperfusion.

Postoperative course: Recipients are electively ventilated and shifted to ICU. Their trachea is extubated once graft function is stable as indicated by stabilization of hemodynamics, improvement in metabolic acidosis, and coagulopathy and drainage of newly produced golden-brown viscous bile and weaning and extubation criteria met (mostly within 12 hours). They are given antibiotics, immunosuppressants and require relatively small amounts of analgesics. Slower weaning is recommended in resistant metabolic acidosis, hyperkalemia, worsening renal function, failure to clear lactate, hypoglycemia and rising transaminase levels which indicates graft dysfunction and those patients with preoperative encephalopathy or ventilatory support.

Suggested reading

1. An International view of Perioperative Issues in Liver Transplantation- Part I and Part II. International Anaesthesiology Clinics 2006; 44 (3,4).
2. Steadman RH. Anaesthesia for liver transplant surgery. Anaesthesiology Clin N Am 2004; 22: 687-711.
3. Miller's Anesthesia, Seventh Edition, Miller RD, Churchill Livingstone 2010

CLUES

ACROSS

1. Intracellular calcium binder
4. Laryngoscopy duo
7. Allergy increased by corn starch powder
9. Tetracaine
11. Cough of a barking seal
12. Anesthetist, graded effect of obstetric anesthesia on neonates
14. Use ultrasonic nebuliser for
17. Electrical system, acting via peripheral A Beta fibres
18. LVEDV

DOWN

2. Patient knows best
3. Cholera anesthetist
4. Introduced into clinical practice by Smallhout and Kalenda
5. Indian born Boston anesthetist
6. Epidural or urinary
8. Overfill prolongs bleeding
10. Indication for topical anesthesia
13. Gave spinal this month
15. Treats lead poisoning in children
16. Negative or positive

Compiled by : Dr. Nisha Kachru & Dr. Anshu Gupta

FUMBLE NO. 4

TTSSAAEELIC

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DEETRASWH

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LTNNEIOGCA

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OORPNMEHUID

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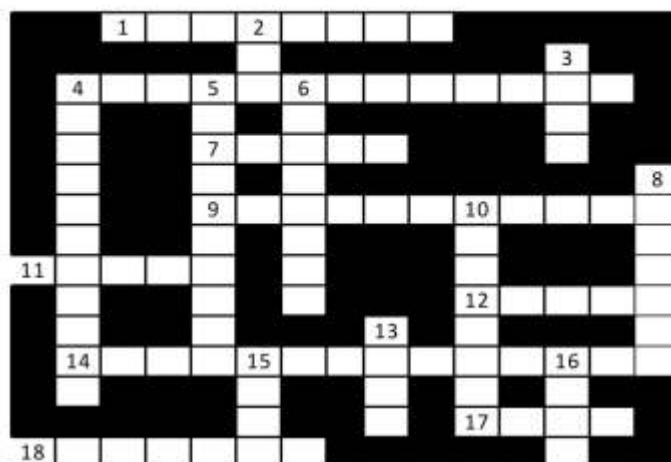
A Lock / Adaptor which sometimes becomes the key to difficult airway situation

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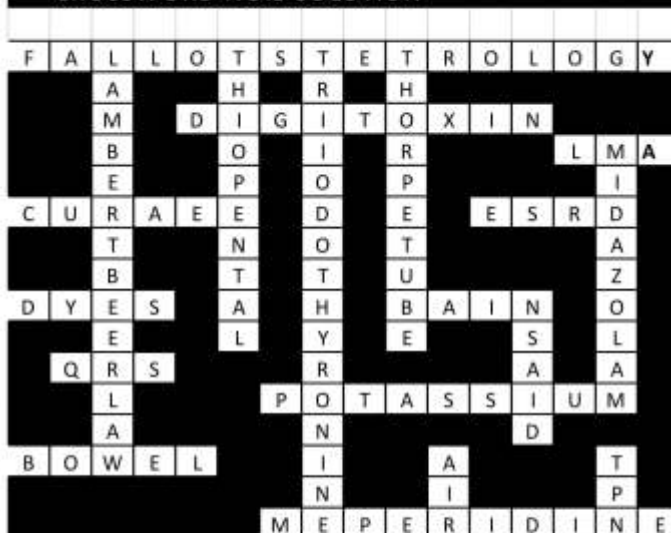
FUMBLE NO. 3 SOLUTION

THIAZIDE, EXOPHTHALMOS, PITUITARY, ACUPUNCTURE, THIXOTROPIC

CROSSWORD NO. 4



CROSSWORD NO.3 SOLUTION



CORRECT ENTRIES FOR CROSSWORD-2

- Dr Amandeep Singh, Apollo Hospital
 Dr Sarla Sindhu, SGRH
 Dr Sushil Guria, VMMC & SJH
 Dr Amit Bansal, VMMC & SJH
WINNER:- Dr Amandeep Singh

CORRECT ENTRIES FOR FUMBLE-2

- Dr Amandeep Singh, Apollo Hospital
 Dr Vandana Dewan, Rockland Hospital
 Dr Sushil Guria, VMMC & SJH
 Dr Amit Bansal, VMMC & SJH
 Dr Ranju Gandhi, SGRH
WINNER:- Dr Ranju Gandhi

Please send your answers by email to isadelhi2010@gmail.com or by post to the Secretariat / Secretary, Dr. (Prof.) Radhika Agarwala, (ISA Delhi Branch), Deptt. of Anaesthesiology, LHMC & SKSCH, New Delhi-1 by June 30, 2010

Winners will be declared in the next monthly meet. Conditions winners must be ISA members. Write your full name, ISA no, designation, place of work, mobile no, e-mail, address. Kindly Register Yourself As ISA Members. All Executive Members To Compulsorily Become ISA Members.

WORLD ANAESTHESIA DAY (16TH OCTOBER, 2010)

HIGHLIGHTS

CULTURAL PROGRAMMES

DUMB CHARADES

GUESS WHO?

Registration Charges : Rs. 300/- per person & Rs. 500/- per couple until 30th September, 2010
From 1st October, 2010 = Rs. 400/- per person & Rs. 700 per couple. NO SPOT REGISTRATION
It is requested that Hospitals interested in participation should contact at the earliest .

Dr Pramod Kohli 9811046848 or any Executive Member

FORTHCOMING EVENTS

29thNov-7th Dec 2010

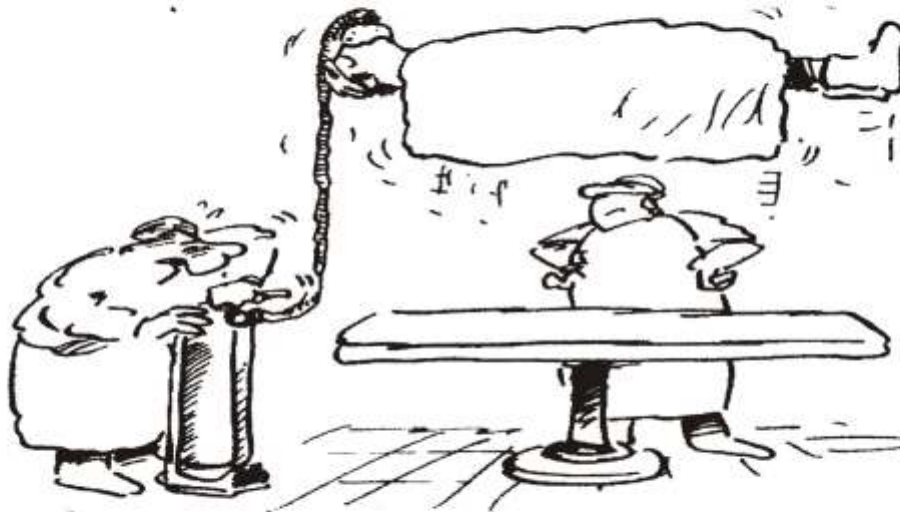
Post graduate Assembly North India 2010
at
Swarn Jayanti Auditorium,

Lady Hardinge Medical College, New Delhi

Registration fees:Rs 4000

Mode of Payment : Cash/Chq/DD
in favour of

“PG Assembly North India” payable at New Delhi



"The valve's stuck ..."

PLEASE NOTE THAT ALL HOSPITALS HOSTING ISA MEETING SHOULD INCLUDE ONE RESEARCH WORK DONE IN THEIR DEPARTMENT FOR THE CLINICAL PRESENTATION DECISION TAKEN AT BATRA CLINICAL MEETING (20th JULY, 2010)