ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 13, Issue, 08, pp.18472-18475, August, 2021

DOI: https://doi.org/10.24941/ijcr.42023.08.2021

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

ANAESTHETIC MANAGEMENT OF ADVANCED LIVER DISEASE PATIENT FOR MAJOR HEAD NECK ONCOLOGY SURGERY: A CASE REPORT

Dr. Deepak C. Koli[1,*], Dr. Siddhesh S. Mhatre[2], Dr. Sulekha Jain[3], Dr. Ankit A. Gupta [4] and Dr. Hemant H. Mehta[5]

[1]Consultant Anaesthesiologist, Department of Anaesthesia and Pain Management, Sir H. N. Reliance Foundation Hospital and Research Centre, Mumbai, Maharashtra, India
[2]Clinical Associate, Department of Anaesthesia and Pain Management, Sir H. N. Reliance Foundation Hospital and Research Centre, Mumbai, Maharashtra, India
[3]DNB student, Department of Anaesthesia and Pain Management, Sir H. N. Reliance Foundation Hospital and Research Centre, Mumbai, Maharashtra, India
[4]Consultant Anaesthesiologist, Department of Anaesthesia and Pain Management, Sir H. N. Reliance Foundation Hospital and Research Centre, Mumbai, Maharashtra, India
[5]Director and Head of the department, Department of Anaesthesia and Pain Management, Sir H. N. Reliance Foundation Hospital and Research Centre, Mumbai, Maharashtra, India

ARTICLE INFO

Article History:
Received 27th May, 2021
Received in revised form
10th June, 2021
Accepted 15th July, 2021
Published online 30th August, 2021

Key Words:

Chronic Liver Disease, TEG, Coombs Test, Anaesthesia, Maxillectomy.

Corresponding author:
Dr. Deepak C. Koli

ABSTRACT

Patients with chronic liver disease pose a serious challenge to anaesthesiologists because of multisystem involvement; despite advances in perioperative management, this subset of patients is at high risk for perioperative hepatic decompensation, encephalopathy, and mortality. In this case report we are describing anaesthetic management of a male patient known case of carcinoma buccal mucosa with maxillary recurrence and chronic liver disease with model for end stage liver disease score of 10 posted for major head neck surgery, we did multidisciplinary team discussion to decide plan for perioperative management of this patient having direct coombs test positive and with apt biochemical testing along with thromboelastography (TEG) guided swift correction with blood and blood products lead to favourable outcome in our patient.

Citation: ***Dr. Deepak C. Koli, Dr. Siddhesh S. Mhatre, Dr. Sulekha Jain, Dr. Ankit A. Gupta and Dr. Hemant H. Mehta.*** **2021.** "Anaesthetic management of advanced liver disease patient for major head neck oncology surgery: a case report", *International Journal of Current Research*, 13, (08), 18472-18475.

INTRODUCTION

Patients with chronic liver disease have a higher risk of perioperative morbidity and mortality. [(1)]These patients' final outcome is usually determined by the severity of their liver disease, their anaemia, their surgical procedure, and the type of anaesthesia they receive. [(2,3)]Currently, the model for end-stage liver disease (MELD) is used to stratify disease severity.[(1)] CTP scores of A, B, and C are correlated with MELD scores of 10, 10-14, and >14 in that order.[(1)]Elective surgery is usually safe for patients with CTP A, which corresponds to a MELD score of 10, but CTP B, which corresponds to a MELD score of 10-14, carries a comparatively high mortality rate of 29 to 33 percent. Studies have shown that elective surgery usually contraindicated in patients with CTP C who have a MELD score more than14. [(4)]A MELD 10 patient scheduled for major head and neck surgery is described in this paper.

CASE REPORT

The 66-year-old patient had a history of verrucous hyperplasia of the right buccal mucosa, was operated three years back, wide local excision with microvascular radial free flap was done, and recently has a recurrence in the right maxilla. Patient was diagnosed with chronic liver disease (CLD) (CTP-B) six months ago.

Patient had huge ascites (asceticcollection) for which taping was done 6 months prior, as well as upper GI endoscopy with variceal bands 6 months ago andlast 3 months prior was done. The patient was on oral propranolol 20mg once a day, as well as oral hypoglycemic medications for diabetes which was diagnosed then. On |PET scan : metabolically active soft tissue lesion was seen epicentered in the right maxilla, involving and causing osteolytic destruction of antero-inferior and medial walls of the maxillary sinus, with involvement of maxillary infrastructure, right superior alveolus, premaxilla, and palatine process of maxilla, crossing the midline, reaching up to the level of left upper canine, medially extending into the right nasal cavity, causing bulge in the nasal septum, along with at least two metabolically active right neck level II nodes, suggestive of disease involvement, PET scan also showed Cirrhosis with portal hypertension, moderate ascites and mild diffuse peritoneal thickening apart from this no other significant abnormality or metabolically active relevant disease was seen elsewhere in the body. Patient was posted for right infrastructure maxillectomy with obturator reconstruction with selective neck dissection.

At first a detailed pre-anaesthesia check-up was done, on clinical examination patient had heart rate 80/min BP 130/80mmhg, bilateral pedal edema and abdominal distension. On airway examination mouth opening was only 2 fingers with mallampatti grade 4, ultrasound abdomen revealed moderate ascites. On echocardiography left ventricular ejection fraction was 60%, mild LV diastolic dysfunction, no evidence of pulmonary hypertension with trivial mitral and tricuspid regurgitation. Laboratory investigation showed a pancytopenic picture: severe anaemia with haemoglobin (HB) 7.5, total count 3510 and platelet count 119000/mm3, (red cell agglutination was noted which was corrected post incubation at 37 degree Celsius after 30 minutes), prothrombin time (PT): patient 15.8 S and control 13.9, international normalized ratio (INR) 1.37, direct coombs test was positive with anti C3d negative IgG hence giving warm blood products was a mandate in this scenario in order to avoid haemolysis. This patient was taken up for surgery under ASA grade III with CTP-B/MELD score 10. Preoperatively patient received inj. vitamin k 10mg iv for 3 days,inj albumin 25% 100ml was given over 4 hrs day before surgery in evening and inj terlipressin 1mg in 5% dextrose 50ml started at 2ml/hr from morning on day of surgery, we ensured that adequate blood products were arranged (10cryoprecitate, 3 PRBC, 6 FFP) in view of probable risk of massive bleeding intraoperatively due to impaired coagulation profile.

On day of surgery the patient was shifted to the operating room (OT), where regular ASA monitors were placed on him. Two large bore IV lines were taken to allow for the quick infusion of blood and blood products if necessary. Rapid sequence induction was performed using inj. fentanyl 100mcg, inj. propofol 120mg and after validating bag and mask ventilation, inj. succinylcholine 100mg was given. As the plan was to do tracheostomy first, followed by right infrastructure maxillectomy, video laryngoscope guided oro-endotracheal intubation was done with no 8 endotracheal tube fixed at 21 cm mark. After verifying correct endotracheal tube position with an etco2 graph and ensuring bilateral equal air entry, inj. Atracurium 50mg was administered once action of succinylcholine had wear off. O2, air, and desflurane (through closed circuit: MAC maintained between 0.8-1.0), as well as intermittent fentanyl top-ups and Atracurium continuous infusion, were used to maintain anaesthesia. The core temperature was maintained between 35.5 to 36.7 degrees with forced air warming throughout procedure while the rectal temperature was measured. Following tracheostomy, a right infrastructure maxillectomy with right side neck dissection was performed, and an Obturator was used to support the Hard palate and was fixed to the surrounding buccal mucosal tissue. Due to the invasive nature of the tissue, surgery was extremely challenging, and blood oozing continued intraoperatively due to a compromised coagulation profile. Intraoperatively, we employed 0.2 to 1mcg/kg/min Inj. Dexmedetomidine 100mcg/50ml Normal saline (2mcg/ml) and Inj. Nitroglycerine 25mg/50ml Normal saline at the rate 0.1 to 0.9mcg/kg/min for control of blood pressure and maintain a MAP around 70 mm hg in order to minimise bleeding during surgical excision. Total operative time was around 8 hours, with estimated blood loss at 1 to 1.2 l. Intraoperatively all blood and blood products were given through HOTLINE^{c} warmer at 40 degree so as to avoid haemolysis as our patients was direct coombs test positive as per our multidisciplinary team discussion. During the procedure, a total of 2 L Plasmalyte-A, 100 ml of 20% albumin, 3 units of packed red blood cells, one unit single donor platelet (SDP), and 6 units of Fresh frozen plasma (FFP) were transfused. Intraoperatively we did thromboelastography (TEG) and haematocrit assessment on regular interval to ensure that blood and blood products were given as per the requirement to keep near-normal coagulation and oxygenation.

Postoperatively patient was shifted to ICU on elective mechanical ventilation on Pressure control ventilation–volume guaranteed (PCV VG) mode (FiO2 50%, tidal volume 450ml,,RR 15, positive end-expiratory pressure 5cm H2O). Patient was sent sedated with Dexmedetomidine 2mcg/ml at 0.2 to 0.5 mcg/kg/min along with intermittent fentanyl bolus for overnight ventilation. Next morning sedation was stopped and on POD1 patient was gradually weaned off ventilatory support kept on T piece and later on Thermovent® T with minimal o2 support , immediate postoperative laboratory reports were as follows CBC 8.8/5920/93000, INR 1.40 Bilirubin total/direct 3.1/1.2, Total protein /Albumin 5.6/3.2 . Rest of the postoperative course was uneventful and patient did not required any further blood products was hemodynamically stable throughout, tracheostomy tube was removed on post-operative day (POD) 9 and patient was discharged on POD 11.

DISCUSSION

In the last two decades of life, approximately 10 percent of patients with advanced liver disease may have to undergo surgery. [1, 5] Preoperative risk stratification in cirrhotic patients is extremely difficult. CTP score and MELD score are commonly used to predict postoperative morbidity and mortality risk in these patients.[4,6,7]The MELD score of our patient was 10. The mortality associated with a MELD score of 10/CTP B has been reported as high as 30 to 31 percent[8]and with rise in each point above MELD score of 8 mortality in first 30 to 90 days increases by almost 14%. As part of preoperative optimisation, our patient received intravenous vitamin K for three days, as recommended in cirrhotic patients. [8, 9] Fresh frozen plasma (FFP) and platelets should be used in preoperative period in case vitamin K fails to correct INR.[10, 11] Benzodiazepines are known to trigger encephalopathy in end stage liver disease [12] hence should be avoided as premedication agent in cirrhotics. Propofol and fentanyl are

documented to be safe anaesthetic agents in patients with cirrhosis.[13,14]Intraoperative use of volatile agents usually leads to vasodilation and peripheral pooling of blood with resultant decrease in hepatic blood flow, of all the volatile agents desflurane is considered as best choice in patients with cirrhosis of liver because it goes through very minimal hepatic metabolism, maintains systemic vascular resistance and hepatic arterial buffer response and provides hemodynamic stability.[15-17]as fentanyl has no active metabolites and excreted via kidneys [18] titrated boluses were used in perioperative period for analgesia and for muscle relaxation atracurium continuous infusion was used during intraoperative period. The patients with cirrhosis of the liver are more likely to experience drug toxicity due to impaired hepatic metabolism of drugs, hypoalbuminemia causing altered blood levels and altered volume of distribution.[18]Due to increased risk of acute renal failure NSAIDS should be avoided, and opioids should be used sparingly.[19]for postoperative sedation we used Dexem infusion (0.2 to 0.5mcg/kg/min) so as to limit use of opioids and benzodiazepine and next day stopped it to wean off patient from ventilator support. In order to circumvent risk of hepatic decompensation it is crucial to maintain appropriate hepatic blood flow and oxygen distribution. [17] Hepatorenal syndrome can be prevented by perioperative use of albumin as its therapeutic benefits are already documented in treatment as well as prevention of same. Use of albumin causes intravenous volume expansion along with modulation of systemic inflammatory response which may have role in restricting end organ dysfunction in patients with liver cirrhosis. [20] We used albumin infusion throughout perioperative period with continuous infusion during intraoperative period to counter massive fluid shifts which occur during prolonged surgery.

Our Patient hadpositive coomb's test result, Direct Antiglobulin test (DAT) or coombs test represents an elementary and simple *in vivo* test and basically demonstrates existence of IgG and/or complement covering the surface of red blood cells. It is commonly used in cases where we are suspecting autoimmune haemolytic anaemia. In case of positive DAT, it has high prognostic value in diagnosing autoimmune origin in haemolytic anaemia patient but at the same time, positive DAT does not mean that patient is going to havehaemolytic anaemia as some time its positive even in patients with normal histology. [21]Our patient had red cell agglutination on peripheral smear which was corrected post incubation at 37 degrees hence after MDT we decided to give all fluid and blood and blood products warmed at 40 degree Celsius to avoid haemolysis. In order to minimise intraoperative bleeding TEG guided transfusion was started from the beginning of surgery, TEG is basically a non-invasive test which quantitatively measures ability of whole blood in formation of clot and its mainly used in liver transplant surgeries and liver disease patients undergoing major surgeries [22]which also has been recommended to use in patients with cirrhosis undergoing surgeries.[23]in our case we did preoperative TEG of the patient which was within normal limit and also did serial TEG in intraoperative period along with haematocrit evaluation so has to give adequate blood and blood products. In order to maintain glucose homeostasis we started neutralized dextrose saline (DNS) 8 units in 500ml DNS with every two hour blood sugar testing. Change in mental status along with reduction in urine output and increasing ascites are threatening signs indicating hepatic decompensation in postoperative period (17). Due to ischemic hepatitis and multiple blood transfusion, rise in bilirubin levels commonly seen in postoperative period. Swift identification of mental changes followed by laboratory testing of ammonia levels and prompt treatment with lactulose and rifaximin can lead to prompt reversal of encephalopathy.

CONCLUSION

To avoid decompensation in patients with liver disease and surgery related morbidity and mortality, special care must be taken to address the numerous physiological disturbances in these patients. In this case report, we emphasise the importance of vigilant coagulation profile monitoring and TEG-guided correction with appropriate blood and blood products, prompt sugar control and correction of electrolyte disturbances, judicious use of anaesthesia agents with minimal impact on liver physiology, and limited use of opioids for the best outcome in such high risk patients.

CONFLICT OF INTEREST: Nil declared by the authors

FUNDING: No funding was received for this paper

REFERENCES

1. Northup PG, Wanamaker RC, Lee VD, Adams RB, Berg CL. Model for End−Stage Liver Disease (MELD) predicts nontransplant surgical mortality in patients with cirrhosis. Ann Surg2005;242:244−51.
2. Pandey CK, Karna ST, Pandey VK, Tandon M, Singhal A, Mangla V. Perioperative risk factors in patients with liver disease undergoing non−hepatic surgery. World J Gastrointest Surg 2012;4:267−74.
3. Millwala F, Nguyen GC, Thuluvath PJ. Outcomes of patients with cirrhosis undergoing non−hepatic surgery: Risk assessment and management. World J Gastroenterol 2007;13:4056−63.
4. Befeler AS, Palmer DE, Hoffman M, Longo W, Solomon H, Di Bisceglie AM. The safety of intra−abdominal surgery in patients with cirrhosis: Model for end−stage liver disease score is superior to Child−Turcotte−Pugh classification in predicting outcome. Arch Surg 2005;140:650−4.
5. Hanje JA, Patel T. Preoperative evaluation of patients with liver disease. Nat Pract Gastroenterol 2007;4:266−76.
6. Farnsworth N, Fagan SP, Berger DH, Awad SS. Child−Turcotte−Pugh versus MELD score as a predictor of outcome after elective and emergent surgery in cirrhotic patients. Am J Surg 2004;188:580−3.
7. Friedman LS. Surgery in the patient with liver disease. Trans Am Clin Climatol Assoc 2010;121:192−204
8. Prenner S, Ganger D. Risk stratification and preoperative evaluation of the patient with known or suspected liver disease. Clin Liver Dis 2016;7:101-5.
9. Rai R, Nagral S, Nagral A. Surgery in a patient with liver disease. J Clin Exp Hepatol 2012;2:238-46.
10. Lisman T, Porte RJ. Rebalanced hemostasis in patients with liver disease: Evidence and clinical consequences. Blood 2010;116:878−85.
11. Kor DJ, Stubbs JR, Gajic O. Perioperative coagulation management – Fresh frozen plasma. Best Pract Res Clin Anaesthesiol 2010;24:51-64.

12. Kiamanesh D, Rumley J, Moitra VK. Monitoring and managing hepatic disease in anaesthesia. Br J Anaesth 2013;111 Suppl 1:i50-61.
13. Suh SJ, Yim HJ, Yoon EL, Lee BJ, Hyun JJ, Jung SW, *et al*. Is propofol safe when administered to cirrhotic patients during sedative endoscopy?
14. Khamaysi I, William N, Olga A, Alex I, Vladimir M, Kamal D. *et al.,* 2011. Sub-clinical hepatic encephalopathy in cirrhotic patients is not aggravated by sedation with propofol compared to midazolam: A randomized controlled study. *J Hepatol.,* 54:72-7.
15. Suttner SW, Schmidt CC, Boldt J, Hüttner I, Kumle B, Piper SN. 2000. Low-flow desflurane and sevoflurane anesthesia minimally affect hepatic integrity and function in elderly patients. *Anesth Analg.,* 91:206-12.
16. Abbas N, Makker J, Abbas H, Balar B. 2017. Perioperative care of patients with liver cirrhosis: A review. Health Serv Insights. 10: 1178632917691270.
17. Vaja R, McNicol L, Sisley I. 2010. Anaesthesia for patients with liver disease. *Contin Educ Anaesth Crit Care Pain.,* 10:15-9.
18. Chandok N, Watt KD. 2010. Pain management in the cirrhotic patient: The clinical challenge. *Mayo Clin Proc.,* 85:451-8.
19. Imani F, Motavaf M, Safari S, Alavian SM. 2014. The therapeutic use of analgesics in patients with liver cirrhosis: A literature review and evidence-based recommendations. *Hepat Mon.,* 14:e23539.
20. Arroyo V, García-Martinez R, Salvatella X. 2014. Human serum albumin, systemic inflammation, and cirrhosis. *J Hepatol.,* 61:396-407.
21. Duran JA, Rodrigues MJ. 2000. Teste de antiglobulina directo: ausência de significado clínico como teste pré-transfusional. ABO Rev Med Transf (1):15-17.
22. Wang SC, Shieh JF, Chang KY, Chu YC, Liu CS, Loong CC, *et al. 2010*. Thromboelastography-guided transfusion decreases intraoperativeblood transfusion during orthotopic liver transplantation: Randomizedclinical trial. Transplant Proc 42:2590-3.
23. De Pietri L, Bianchini M, Montalti R, De Maria N, Di Maira T, Begliomini B. *et al. 2016.* Thrombelastography-guided blood product use before invasive procedures in cirrhosis with severe coagulopathy: A randomized, controlled trial. Hepatology 63:566-73.

****