



Case report

Anaesthesia for the patient undergoing Hepatectomy

Bigen Man Shakya

Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu, Nepal.

Abstract

A 41 year old lady was planned for left hepatectomy for Intrahepatic Cholangiocarcinoma. This article describes the case and perioperative concerns during hepatectomy. Hepatectomy is a challenging procedure both for surgeons and anaesthesiologist. Better understandings of physiology and advancements in both the fields have markedly reduced the mortality related to hepatectomy. The major concern is the blood loss during the resection of tumor. Blood loss is minimized by multi - modal perioperative techniques. Pringle maneuver is used by surgeons to minimize blood loss during resection but have significant hemodynamic changes. The central venous pressure should be kept below 5 cm of H₂O particularly during resection to minimize blood loss. The use of epidural for postoperative analgesia is controversial. Postoperative hepatic failure occurs in 3 % of cases. A good postoperative care with monitoring on relevant parameters is needed for better outcome.

Key words: Anaesthesia; Intrahepatic Cholangiocarcinoma; Hepatectomy.

Article History

Received 03rd January 2014
 Accepted 27th February 2014
 Published on print 01st March 2014
 Published online 24th December 2014

© Authors retain copyright and grant the journal right of first publication with the work simultaneously licensed under a [Creative Commons Attribution License](http://creativecommons.org/licenses/by/4.0/) that allows others to share the work with an acknowledgement of the work's authorship and initial publication in this journal.

How to cite this article: Shakya BM. Anaesthesia for patient undergoing hepatectomy. JSAN 2014;1:49-50.

Case Report

A 41 year old lady from sindhupalchok was planned for left hepatectomy for Intrahepatic Cholangiocarcinoma. She presented to surgical department with complain of pain upper abdomen on and off for past one year. The patient had no co-morbid condition and belonged to American Society of Anesthesiologist Physical Status I. She was classified as Child Pugh score A .Surgery was planned under General anaesthesia with invasive hemodynamic monitoring. Intravenous assess was established with 16 G cannula on right cubital vein. Continuous monitoring of blood pressure was accomplished by catheterization of left radial artery with a 20 G cannula. Trachea was intubated after giving Intravenous (IV) 100 mcg of Fentanyl, Propofol 100mg, Atracurium 25 mg. Fentanyl was supplemented 0.5mcg/kg hourly. Anaesthesia was maintained with oxygen, Isoflurane and Atracurium as required. The central venous catheter was kept in right Internal jugular vein. The duration of surgery was about 3 hours. At the beginning of surgery, fluid was restricted. Central venous pressure (CVP) was also monitored and was kept below 5 cm of H₂O by restriction of fluids and use of IV Furosemide. During the resection Pringle maneuver was performed by surgeon twice, 9 min and 15 min of duration. After the resection of liver, total of 2500 ml of crystalloid and two unit of whole blood were required. A total urine output was 800 ml. At the end of surgery, after reversal of neuromuscular blockade, extubation of trachea was done. Postoperative pain was managed with IV Tramadol 50 mg 6 hourly and IV Ketorolac 30 mg 8 hourly. Postoperative period was uneventful except for mild increase in Aspartase transaminase and Alaline transaminase (AST and ALT) level. Prothrombin time (PT) was normal. She was discharged to ward on 3rd post operative day and later discharged from hospital on 7th day.

Discussion

The resection of liver is possible due to the regenerating capacity of remaining liver parenchyma. In the past, it had mortality rate of around 20%.¹ The current perioperative mortality rate is 1% to 7%.² This is due to improvements

Correspondence at

Bigen man shakya

Lecturer, Department of anesthesiology,

Tribhuvan University Teaching Hospital (TUTH), Institute of Medicine, Maharajgunj, Kathmandu.

shakya.bigen@gmail.com

Telephone: +9779841227182.

in patient selection, understanding of physiology and surgical and anaesthetic techniques. Some of the indications of liver resection are benign and malignant primary hepatobiliary tumor, colorectal hepatic metastasis and donation for transplantation.

The Child Pugh scoring system is one the tools for the assessment in hepatobiliary surgery. The outcome depends on score and Child Pugh score of A has better outcome after resection.³ Invasive hemodynamic monitoring should be applied in addition to minimum standards of monitoring.

The surgical procedure can be divided into three main phases: initial, resection and closure. The second phase is of major concern to anaesthesiologist. The blood supply to liver can be temporarily reduced by occlusion of vascular flow. This is done to reduce blood loss during resection. This causes hemodynamic changes. One of the methods is Pringle maneuver which consists of total inflow occlusion of the portal vein and hepatic artery. This causes decrease in cardiac output up to 10% and increase in left ventricular afterload of 20% to 30%.⁴ Sometimes clamps are placed on supra and infra hepatic venacava in addition to Pringle maneuver for total hepatic vascular occlusion. This causes decrease in cardiac output of up to 60% and severe hypotension.

Intraoperative coagulation profile should be monitored and corrected as indicated by laboratory values. Fresh frozen Plasma can be used intraoperatively to correct coagulopathy. Platelets are transfused base on clinical judgement only because of rapid removal by spleen with transient effect only. Thromboelastography provides an excellent real-time guide in treating coagulopathy in major hepatic resections.

The major concern is blood loss during liver resection. The blood loss can be minimized by using Pringle maneuver and low CVP during resection. The reduction of CVP during hepatic resection may dramatically reduce intraoperative blood loss by reducing hepatic venous congestion.⁵ It has been well documented that a CVP of more than 5 cm H₂O significantly increases bleeding and should be kept below 5 cm of H₂O as far as possible during resection. To achieve low CVP, Pre-resection fluid transfusion should be restricted. The other methods are use of Diuretics and Vasodilators. The disadvantages of low CVP are risk of inadequate perfusion to vital organ and risk of air embolism. Therefore a complex balance must be maintained between what is considered adequate mean arterial pressure and controlled hypovolemia. After the resection phase, circulating blood volume can be restored. The triad of acidosis, hypothermia and hypocalcaemia is well known for aggravation of bleeding so they should be monitored and treated.

The use of epidural catheter for postoperative pain control is highly controversial because of complex nature of coagulopathy. Prothrombin time usually rises postoperatively, peaks in second day and normalizes in four to six days. Such impairment of coagulation could theoretically increase the risk of epidural hematoma. However epidural analgesia has been used.⁶ The risk and benefit of epidural analgesia must be carefully judged. Pain can be controlled by judicious use of Intravenous opioid preferably using patient-controlled analgesia system. Single shot intrathecal opioids has also been tried.

The common post operative complications are coagulopathy, renal and liver dysfunction, intra-abdominal infection and sepsis. The incidence of postoperative hepatic insufficiency is around 3% .³ Adequate fluid balance should be carefully maintained. Hypovolaemia in first 48 hours due to ascites is common. Hypophosphatemia is the commonest electrolyte disorder.⁷ It can cause cardiac arrhythmias, hematological dysfunction, insulin resistance so the phosphate should be supplemented as required. Blood sugar should be tightly controlled. The postoperative course depends on extent of resection and high risk patient.

In conclusion, a detailed preoperative assessment is required in patient undergoing hepatectomy. One of the concerns is the major blood loss during resection and it should be managed by Pringle maneuver and keeping low central venous pressure. The coagulopathy should be managed well. Most of the low risk group patients can be managed in post operative ward with adequate monitoring.

References

1. Foster JH, Berman MM. Solid liver tumors. *Major Probl Clin Surg* 1977;22:1-342.
2. Allen PJ, Jarnagin WR. Current status of hepatic resection. *Adv Surg* 2003;37:29-49.
3. Hartog A, Mills G. Anaesthesia for hepatic resection surgery. *Continuing Education in Anaesthesia, Critical care and Pain* 2009;9:1-5
4. Lentschener C, Ozier Y. Anaesthesia for elective liver resection: some points should be revisited. *Eur J Anaesthesiol* 2002;19:780-8.
5. Chen H, Merchant NB, Didolkar MS. Hepatic resection using intermittent vascular inflow occlusion and low central venous pressure anesthesia improves morbidity and mortality. *J Gastrointest Surg* 2000;4:162-7.
6. Matot I, Scheinin O, Eid A, Jurim O. Epidural anesthesia and analgesia in liver resection. *Anesth Analg* 2002;95:1179-1181.
7. Datta HK, Malik M, Neely RD. Hepatic surgery - related hypophosphatemia. *Clin Chim Acta* 2007;380:13-23.