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## Case Report

## Anaesthesia management for hepatic adenoma excision surgery

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## Abstract

This case report describes the comprehensive anaesthesia management of a 65-year-old male patient undergoing left-side hepatectomy for a hepatic adenoma. The patient presented with epigastric pain, and imaging revealed a significant liver mass. Thorough preoperative optimization, including cardiac and respiratory evaluations, was performed. Plan of anaesthesia was general anaesthesia with lower thoracic epidural anaesthesia. Intraoperatively, meticulous monitoring and haemostatic techniques were employed to manage expected heavy blood loss. Postoperative care included ICU monitoring, multimodal analgesia, and gradual recovery, leading to a successful discharge. This case highlights the importance of a multidisciplinary approach in managing hepatic adenomas, particularly in high-risk surgical settings. A review of the relevant literature is provided to contextualize the anaesthetic strategies employed.

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## 1. Introduction

Hepatic adenomas are benign tumors of the liver that can present significant challenges in the management, particularly when surgical intervention is required.<sup>1</sup> The risk of haemorrhage and potential malignant transformation necessitates careful preoperative assessment and anaesthetic planning.<sup>5,6</sup> This report details the anaesthesia management of a patient undergoing left-side hepatectomy for a hepatic adenoma, emphasizing the perioperative strategies employed to ensure a safe surgical outcome.

## 2. Case Report

## 2.1. Patient information

A 65-year-old male, weighing 47 kg and 162 cm tall, presented to the gastro-surgical outpatient department with a one-year history of epigastric pain which gradually increased in intensity. His medical history was unremarkable, with no significant past illnesses or habits of smoking or alcohol consumption. Imaging studies, including MRCP and MDCT, revealed a well-defined exophytic mass in the liver of size 7.6cm×6.9cm×9.2cm, prompting surgical intervention.

## 2.2. Anaesthesia management

## 2.2.1. Preoperative phase

The preoperative management of the patient was comprehensive and aimed at optimizing the patient's condition for surgery. The patient underwent a thorough pre-anaesthetic assessment, including a detailed medical history, physical examination, laboratory and radiological investigations. Normal liver function tests, renal function tests, and coagulation profiles were crucial in determining the patient's fitness for surgery. Preoperative cardiac evaluation, including a 2D echocardiography, revealed an ejection fraction of 55-60%, mild concentric left ventricular hypertrophy, grade I left ventricular diastolic dysfunction, mild tricuspid regurgitation (TR), and mild pulmonary arterial hypertension (PAH). Based on these findings, a cardiology consultation was obtained for surgical fitness. Pulmonary function testing indicated normal spirometry and adequate pulmonary reserve. Comprehensive examination of all other systems revealed no abnormalities, confirming suitability for proceeding with major surgery.

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The patient was started on a high-protein diet to enhance nutritional status, and incentive spirometry was also started to improve lung function and reduce the risk of postoperative pulmonary complications. High risk consent was taken, post-operative ICU-Ventilator and adequate blood products were reserved for the surgery and patient was kept Nil per Oral for 8 hours. On the day of surgery 2 wide bore(16G) peripheral venous access was secured and after shifting patient to operative theatre and attaching all vital monitors the patient received intravenous preoperative medications, including Injection glycopyrrolate (0.004mg/kg), ondansetron (0.1mg/kg), and midazolam (0.05mg/kg), before the procedure.(Figure 1, Figure 2)



**Figure 1:** The field after surgical exposure



**Figure 2:** The resected tumor mass

### 2.2.2. Intraoperative phase

The intraoperative management began with the induction of anaesthesia. A Lower thoracic epidural catheter was placed at the T7-T8 level, which provided effective anaesthesia and analgesia for the anticipated surgical duration and for post-operative pain relief as sub coastal incision (Chevron incision) was large and bilateral (approx 18-20cm). General anaesthesia was induced with intravenous Inj. fentanyl (2mg/kg), Inj. propofol(2mg/kg), and Inj. succinylcholine(1.5mg/kg), followed by oral endotracheal intubation with 8 mm portex tube. The tube was fixed after ETCO<sub>2</sub> confirmation and Inj. Vecuronium (0.1mg/kg IV) was given as muscle relaxant. Depth of anaesthesia was

maintained on Oxygen, Air, Sevoflurane and Inj Vecuronium (0.02mg/kg IV). Ryles tube inserted, and Foley catheterization was done. Warmer was kept to prevent hypothermia as the duration of surgery was long and bandaging was done on both lower limbs to prevent venous stasis. Invasive monitoring was established, including Right radial arterial line (for arterial blood pressure monitoring) and Right subclavian venous catheterization (for central venous pressure monitoring). The aim was to maintain a low heart rate (60-65bpm), low mean arterial pressure (65-70mmHg), and low central venous pressure (4-6 cm of H<sub>2</sub>O) throughout the procedure to minimize bleeding risks. Before the surgical incision Inj. Mannitol 20% (w/v) 100ml was given intravenously which helped in maintaining low CVP. Inj. Dexmedetomidine 0.5mcg/kg were given intravenously to maintain surgical depth. Inj. Dexamethasone 8mg IV was given to minimize airway edema.

The surgery lasted for approximately 6 hours and careful attention was paid to haemostasis.

Intraoperative, one unit of packed red blood cells was transfused in response to approximate blood loss of 900 ml. During the surgery, two episodes of hypotension were noted and effectively managed with intravenous doses of Inj. Phenylephrine, 10 mcg per dose. Blood gas analysis and blood sugar monitoring was done twice intraoperative, 1<sup>st</sup> before resection of tumor and 2<sup>nd</sup> before extubating. Both the parameters were normal. After tumor mass was resected gradually CVP (Central Venous Pressure) was increased to 7cm of H<sub>2</sub>O, MAP (Mean Arterial Pressure) to 80 mmHg by giving fluids and Packed Cell Blood. Before extubating Inj Frusemide 20mg IV was given.

### 2.2.3. Postoperative phase

Postoperatively, the patient was extubated in the operating room and transferred to the ICU for close monitoring. The use of epidural analgesia facilitated comfortable breathing and pain management as the surgical incision was large. This helped in early mobilization and recovery. A pneumatic compression device was used to prevent deep vein thrombosis.

The patient received two units of packed red blood cells and two units of fresh frozen plasma in ICU to address coagulopathy and blood loss.

On postoperative day two, incentive spirometry and physiotherapy were reinitiated to promote lung expansion and prevent atelectasis. The patient progressed to a liquid diet by day three after passing flatus, indicating the return of gastrointestinal function. The epidural catheter was removed on day four after confirming stable coagulation profiles, and the patient was monitored for any signs of complications. The fentanyl transdermal patch (25 mcg/hr) was applied on day four, 12 hours prior to the removal of the epidural catheter, and was maintained for the next 72 hours, providing adequate analgesic coverage.

The patient was shifted to the ward on day six and subsequently discharged from the hospital on day fifteen, following a satisfactory recovery and histopathological confirmation of a well-differentiated hepatocellular carcinoma.

### 3. Discussion

The management of hepatic adenomas, particularly in the context of anaesthesia, presents unique challenges that necessitate a multidisciplinary approach. The case presented illustrates the importance of thorough preoperative assessment and optimization, which is crucial for patients classified as ASA-3.<sup>1</sup>

Preoperative optimization, including nutritional support and respiratory therapy, has been shown to significantly reduce postoperative complications in patients undergoing liver surgery.<sup>2</sup> In this case, the patient underwent a comprehensive evaluation, including cardiac and respiratory assessments, to ensure their fitness for the procedure. The use of incentive spirometry and a high-protein diet aimed to enhance the patient's physiological reserve and minimize the risk of postoperative pulmonary complications.

Intraoperatively, the combination of general anaesthesia with thoracic epidural analgesia has been associated with improved postoperative outcomes, including reduced pain and lower incidences of pulmonary complications.<sup>3,4</sup> This approach provides effective analgesia and facilitates early extubation, which is crucial for enhancing recovery. The careful monitoring of hemodynamic parameters, such as mean arterial pressure and central venous pressure, is essential during liver surgeries due to the risk of significant blood loss and the potential for hepatic dysfunction.<sup>5,7,8</sup>

In the postoperative phase, the use of epidural analgesia has been associated with improved recovery profiles and decreasing over all analgesia requirement and enhanced pulmonary function.<sup>3,4</sup> This case supports findings from other studies that emphasize the role of enhanced recovery protocols in liver surgery, which advocate for multimodal analgesia and early mobilization to optimize outcomes.<sup>2,6</sup>

The successful outcome in this case underscores the importance of a multidisciplinary approach in managing hepatic adenomas, particularly in high-risk surgical settings.<sup>9,10</sup> The integration of thorough preoperative preparation, intraoperative vigilance, and postoperative care is essential to minimize complications and promote recovery. Future studies should continue to explore the impact of various anaesthetic techniques on outcomes in patients undergoing liver surgery, particularly in those with complex comorbidities.

### 4. Conclusion

This case report underscores the critical role of anaesthetic management in the successful surgical intervention of hepatic

adenomas. The integration of thorough preoperative preparation, intraoperative vigilance, and postoperative care is essential to minimize complications and promote recovery. Future studies should continue to explore the impact of various anaesthetic techniques on outcomes in patients undergoing liver surgery, particularly in those with complex comorbidities.

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### 6. Conflict of Interest

Nil.

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