





in sitting position, an epidural catheter via Tuohy needle was inserted into epidural space (T9-10, T10-11 and L4-L5) using loss of resistance technique to air; and fixed 3.5cm catheter was left in the epidural space. Mixture of 0.5% plain bupivacaine and fentanyl (2µg/ml of bupivacaine) was titrated in 2mls aliquot to achieve the desired block level. Between 10 to 15mls of 0.5% plain bupivacaine with 20 to 30µg/ml of fentanyl was used to achieve block level of T4 to L2. Intravenous paracetamol 1g was infused in all patients before

knife on skin. The postoperative pain management was provided epidurally with 5mls of 0.125% of plain bupivacaine 4 hourly for 24 hrs.

Five patients (Table 1) with severe cardio-respiratory diseases who had non-cardiac surgeries under either thoracic or lumbar epidural anaesthesia are presented. The surgical procedures, anaesthetic considerations and available options were discussed with the patients and they chose epidural anaesthesia

**Table 1: Characteristics of Patients and Anaesthesia**

Patient	Age (yrs)	Sex	ASA status	Diagnosis	Co-morbid conditions	Epidural Anaesthesia	EF(%)
One	17	F	4E	Huge OM	RF	Thoracic	-
Two	36	F	4E	MS	RF	Thoracic	-
Three	81	M	3E	FF	DM/HHD	Lumbar	29%
Four	99	F	4E	FF	HHD	Lumbar	32%
Five	69	M	4E	VCF	HHD	Lumbar	32%

OM= ovarian mass, MS=Meig’s syndrome, FF=femoral fracture, VCF= septic vesico-cutaneous fistula  
RF=respiratory failure, DM=diabetes mellitus, HTN, hypertensive heart disease

**Case Reports**

**Case 1**

Patient FI was a 17 year female presented with 3 months history of progressive abdominal swelling, constipation, vomiting, generalized bodyweakness, difficulty in breathing, weight loss, abdominal pain and bilateral leg swelling. Examination showed a chronically ill-looking patient in severe respiratory distress, jaundiced with bilateral pitting pedal oedema. Her respiratory rate was 34 cycles per minute with evidence of right pleural effusion, reduced air entry on the right middle and lower lung zones with coarse basal crepitations. Her abdomen was massively distended with demonstrable ascites. Her pulse rate was 154bpm, blood pressure 150/100mmHg and her peripheral

arterial oxygen saturation (SpO<sub>2</sub>) was 86% in room air. Abdominal CT scan revealed huge abdomino-pelvic mass with multiple para-aortic and pelvic lymph nodes and evidence of liver metastasis.

A provisional diagnosis of huge ovarian tumour was made and patient was scheduled for exploratory laparotomy and surgical debulking but physiologically unstable to tolerate general anaesthesia. Following pre-anaesthetic assessment patient was graded as ASA IVE and airway assessment was Mallampati I. Her ability to tolerate any form of general anaesthesia without developing morbidity or mortality could not be guaranteed.

The surgery was done under thoracic epidural at T11/T12 inter-space using 24µg of fentanyl in 12mls of 0.5% plain bupivacaine. Haemodynamic





who were treated with dose-titrated epidural anaesthesia.

The major drawback of regional anaesthesia is hypotension secondary to unhindered blockade of sympathetic system. The hypotension may be a cause of myocardial ischaemia if it is not actively managed with rapid fluid infusion or administration of vasoconstrictor. Myocardial muscle toxicity and depression has been ascribed to high dose of local anaesthetic agent during regional anaesthesia (Kaul TK *et al*, 2007). Significant hypotension occurred in most of our patients despite the preventive steps taken; local anaesthetic agent was given slowly in small aliquots until the desired level of block was reached. The encountered haemodynamic instability in our study is dissimilar to the results from some studies where stable haemodynamic parameters were observed from use of the same anaesthetic method (Onk D *et al*, 2015; Kiran LV *et al*, 2014). However, the hypotension was successfully managed with ephedrine alone or infusion of cardiac dose of dopamine up to the immediate post-operative period in the recovery room under continuous monitoring.

Catheter-based dose titrated epidural anaesthesia helped in reducing morbidity and mortality in these high risk patients, perhaps due to the lower concentrations of myocardial norepinephrine, angiotensin II, endothelin-1 and tumour necrosis factor alpha which can cause over-stimulation of stress response to surgery and worsen the outcomes. All these hormones and cytokines have been shown to be significantly reduced in a study on rat model where comparative effects of regional versus general anaesthesia were examined (Zhao YJ *et al*, 2014). Microscopic examination showed higher number of myocardial cells indicative of more damage in general anaesthesia group compared with high thoracic epidural group.

### Conclusion

This case series shows that catheter-based epidural anaesthesia, titrated to desired level of block, can serve as a rescue anaesthetic technique in high risk surgical patients with significant cardio-respiratory diseases. The technique can avoid the need for postoperative ventilation; prevent prolonged hospital length of stay and possible nosocomial infections with resultant good surgical outcome. However, generalization of the results of this case series should be cautiously considered due to the small size of the reported patients.

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