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CLINICAL INFORMATION

Inferior venacaval compression due to excessive abdominal packing

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Abstract Inferior venacaval compression is a common problem in late pregnancy. It can also occur due to compression of inferior venacava by abdominal or pelvic tumors. We report a case of acute iatrogenic inferior venacaval compression due to excessive abdominal packing during an intraabdominal surgery.

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Introduction

Inferior venacaval compression is a common problem in late pregnancy.¹ It can also occur due to compression of inferior venacava by abdominal or pelvic tumors. Acute inferior venacaval compression is associated with severe hemodynamic variations. We report a case of acute iatrogenic inferior venacaval compression due to excessive abdominal packing during an intraabdominal surgery.

Case report

A forty-five-year-old male patient with carcinoma head of pancreas was posted for Whipple's procedure. He was a well controlled hypertensive on oral metoprolol 25 mg once daily. His effort tolerance was good. He did not have any other coexisting disease and all routine investigations including ECG, Echocardiogram were within normal limits. He received combined epidural and general anesthesia with standard monitors including intra-arterial blood pressure and central venous pressure (CVP) monitoring. A 20 G epidural catheter was inserted at T8-9 interlaminar space with an 18 G Tuohy's needle before induction of general anesthesia and position of the catheter was confirmed by injecting solution containing 60 mg lidocaine and 15 µg adrenaline. General anesthesia was induced with intravenous fentanyl 200 µg, propofol 150 mg and trachea was intubated after

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achieving neuromuscular blockade with intravenous vecuronium 8 mg. Anesthesia was maintained with morphine, oxygen, nitrous oxide and isoflurane with positive pressure ventilation. Epidural anesthesia was initiated with 8 mL of 0.25% bupivacaine and maintained with 0.25% bupivacaine infusion at the rate of 8 mL h⁻¹. The surgery was uneventful during the first two intraoperative hours with a normal heart rate (80–90 bpm), blood pressure (110/70–124/82 mmHg), EtCO₂ (33–35 mmHg), SPO₂ (98–99%) and CVP (8–10 mmHg). In the third intraoperative hour, sudden brisk bleeding was noticed as one of the tributaries of the superior mesenteric vein was accidentally severed and around 100–125 mL of blood was lost over 5 min. Surgeon tried to stop bleeding by ligating the bleeding vessel but failed. So as a temporary measure until the availability of vascular clips, abdominal packing was done at the site of bleeding. Immediately a sudden fall in heart rate from 80 bpm to 30 bpm, blood pressure from 124/74 mmHg to 56/34 mmHg, CVP from 10 mmHg to 2 mmHg and EtCO₂ from 34 mmHg to 10 mmHg was noticed. The pulse oximeter started giving poor signal alarm. ECG did not show any rhythm or ST-T changes. Patient was immediately administered with intravenous atropine 0.6 mg, ephedrine 30 mg and rapidly infused with 1000 mL ringer lactate (over 5 min). Even 10 min after initiating above measures, there was only a slight increase in heart rate to 44 bpm, blood pressure to 70/46 mmHg, EtCO₂ to 18 mmHg and CVP to 4 mmHg. The pulse oximeter continued to give poor signal alarm. As a desperate measure the surgeon was requested to remove the abdominal packs from the bleeding site. Soon after the removal of abdominal packs, increase in the heart rate, blood pressure and EtCO₂ was observed which reached normal levels in less than a minute. Hemostasis was achieved by application of vascular clips. The surgery was later completed uneventfully. The postoperative period was uneventful.

Discussion

Compression of the inferior venacava on the vertebral bodies by the gravid uterus is seen commonly when a pregnant woman lies supine which leads to a decrease in the cardiac output because of obstruction to the venous return.¹ This is manifested as dizziness, nausea, and restlessness. In the pregnant women under general anesthesia, inferior venacaval compression will present with sudden drop in blood pressure, heart rate and end tidal carbon dioxide level which gets corrected by either left lateral tilt of the gravid uterus or by the rapid extraction of the fetus. Similar acute events have been reported in orthopedic patients undergoing surgery in lateral position whose abdomen was compressed by the abdominal post supports.²

Our patient, who was stable during the first two intraoperative hours, developed sudden severe drop in the blood pressure, heart rate, CVP and EtCO₂ soon after packing over the bleeding site by the surgeon. There was no significant clinical improvement after administration of atropine, vasopressor and rapid fluid infusion which ruled out the blood loss as the cause of hemodynamic derangement. Insignificant changes in ECG and decreased CVP ruled out cardiac event and pulmonary embolism as possible causes of the hemodynamic derangement. Thoracic epidural anesthesia administered for this patient was limited to 4–5 segments and also there was no significant hemodynamic improvement after administration of atropine, ephedrine and intravenous fluids which ruled out the thoracic epidural anesthesia induced sympathetic blockade as the cause of this abrupt hemodynamic change. The drastic clinical improvement seen after the removal of abdominal packs by the surgeon indicated that inferior vena caval compression by excessive abdominal packing was the cause for the above hemodynamic fluctuation. The mechanism of bradycardia associated with hypotension is a fall in right atrial filling due to inferior venacaval compression, which decreases outflow from intrinsic chronotropic stretch receptors located in the right atrium and great veins.³

Conclusion

The episode of sudden bradycardia, hypotension and fall in EtCO₂ was due to inferior venacaval compression caused by excessive abdominal packing over the bleeding site which was supported by improvement in the clinical condition soon after the removal of abdominal packs. If it had gone unnoticed or uncorrected, it could have led to a catastrophic event. So anesthesiologists should keep in mind, the excessive abdominal packing as one of the potential causes of inferior venacaval compression.

Conflicts of interest

The authors declare no conflicts of interest.

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