Case report

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Continuous caudal epidural anaesthesia for vaginal hysterectomy in a patient of heart disease and severe spinal deformity; a case report

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Abstract

We present this case report where we have used fluoroscopic localization of caudal space and caudal epidural catheter placement to conduct caudal epidural anaesthesia in a case of vaginal hysterectomy and colporrhaphy with co-morbidity of severe spinal deformity, valvular heart disease and pulmonary hypertension.

Keywords: Caudal epidural block, fluoroscopic guided, vaginal hysterectomy, kyphoscoliosis, valvular heart disease, pulmonary hypertension

Introduction

Caudal epidural anaesthesia has been used successfully in adult patients either as primarily sole anaesthetic technique, [1] adjuncts to general anaesthesia to provide postoperative analgesia [2,3]. In adult female patients, caudal epidural anaesthesia for vaginal hysterectomy has been suggested in anaesthesia literature [4]. However, is not a popular anaesthetic technique in adult patients due to anatomical difficulties in procedure and uncertainty of effect in adult patients [5,6,7]. Recent literature suggests that caudal epidural anaesthesia is again gaining acceptance for adults particularly for ano-rectal and minor gynaecological surgery which provides early ambulation and higher satisfaction [8,9]. Due to availability of fluoroscopy and ultrasound for easy localization, this technique is frequently used for caudal steroid injection in adult patients as interventional pain management tool to treat sciatica [10,11,12]. In present case report, we used this technique for vaginal hysterectomy in adult female because conventional epidural or spinal anaesthesia was not feasible and general anaesthesia was considered more risky due to her existing cardiac disease.

Case Report

A female 47 years of age and 60kg weight with prolapsed uterus was scheduled for vaginal hysterectomy and colporrhaphy. She has history of rheumatic heart disease and had corrective surgery for atrial septal defect (ASD) & ventricular septal defect (VSD) in 1985. On examination; ant chest wall showed scar of previous cardiac surgery, thoracic cage was abnormal with crowding of ribs and spine has severe kypho-scoliosis of thoraco-lumbar spine. Spinal landmarks could not be palpated below T1/T2 level. Whole lumbar area showed a bony mass on the left side and no bony landmark in the midline or on the right side

(Figure 1). Landmarks for caudal anaesthesia were well defined. She was dyspnoeic, Heart rate was 96/min and Blood pressure was 140/86 mmHg. Airways assessment showed no abnormality. On chest auscultation air entry was adequate on both sides but occasional rhonchai and crepitations were present.

Previous physician (cardiologist) advised Tablet Spironolactone (20mg) daily and Tablet Digoxin (0.25) ½ tab daily and steroid inhaler, which she was not taking. Routine blood and urine investigations were normal, current echocardiography showed severe tricuspid regurgitation, mild aortic and mitral regurgitation and pulmonary hypertension along with dilated aortic root, right atrium and diastolic dysfunction. X-rays of spine showed severe deformity of spinal anatomical structures at lumbar as-well- as thoracic area (Figure 2 and Figure 3). She was advised to take prescribed medicines along with course of antibiotics and was reviewed after two weeks. Chest condition was improved and she was scheduled for surgery.

One day before scheduled day of surgery, after informed consent and discussion about anaesthesia choices and associated risks, she was taken to operation theatre for anatomical assessment of spinal structure for possibility of fluoroscopic guided regional anaesthesia (spinal or epidural). Except identifiable caudal space, spinal structures could not be identified for safe conduct of spinal or epidural block. Finally plan for fluoroscopic guided caudal anaesthesia with catheter technique was made.

Next day in operation theatre (OT), intravenous fluid was started, monitors were connected and she was positioned prone on OT table. After cleaning and draping the area and with due a-septic precautions, caudal space was identified in lateral fluoroscopic view (Figure 4a). Skin and sub cutaneous tissue was infiltrated with 2ml, 1% lidocaine with 26G hypodermic needle at entry point and 19G tuohy needle was inserted at

Figure 1. Severe Thoraco-lumbar Kyphoscoliosis.

Figure 3. Lateral View of spine.

Figure 2. AP view of spine showing diffuse degenerative changes with structural deformity.

Figure 4a. Tuohy epidural needle in caudal space.

Figure 4b. Leaner spread of contrast in caudal space.

about 45° in caudal space and 1ml water soluble contrast was injected to confirm proper needle position (**Figure 4b**) than a flexible tip, wire reinforced epidural catheter was inserted up to 10cm mark (**Figure 5a**) and proper position (insertion level up to sacral promontory and no vascular injection) was confirmed by 1ml contrast injection through catheter (**Figure 5b**). Catheter was secured with adhesive tape and patient was turned supine. Epidural injection of 10ml 0.75% Ropivacaine was given. After 15minutes sensory level up to L1/

Figure 5a. Caudal epidural catheter inserted in epidural space through Tuohy needle.

Figure 5b. Catheter in caudal epidural space.

L2 was achieved. Intravenous sedation with Inj. Fentanyl 50mc and Midazolam 1.0mg was given and patient was positioned in lithotomy position. Another 10ml of 0.75% Ropivacaine was given to attain level up to T8. Surgery was uneventful (surgical time 130min), blood loss 200ml, she received 1.5L crystalloid fluids during operation and required two doses of Inj. ephedrine (6mg each) to maintain BP. Postoperatively she was managed in HDU (high dependency unit) where continuous monitoring of vitals was done. Visual analogue score (VAS) was done hourly for first four hours and then four-hourly for 48 hrs. Post-operative analgesia was provided with epidural injection of 3mg preservative free Inj. Morphine + 3ml 0.2% ropivacaine whenever VAS was more than 3. Injection Paracetamol 1 G intravenous (IV) was advised to use if, pain relief is not achieved within 30 minutes of epidural injection. Good analgesia was achieved with epidural analgesia only; each dose gave relief for more than 10-12 hrs on first 24 hours and more than 20 hours for next 24 hrs. After that, epidural catheter was removed and analgesia was provided with oral analgesics Tab. Paracetamol (500mg) and Tramadol (50mg)

orally. Patient was discharged home on 5th post-operative day.

Discussion

Vaginal hysterectomy can easily be done under either general anaesthesia or central neuraxial block like spinal or epidural anaesthesia. We routinely do our cases of vaginal hysterectomy under combined spinal- epidural anaesthesia except when there is a contraindication or patient refusal for regional anaesthesia. Fluoroscopic guided injection of spinal or epidural is one of the options with technically difficult spinal [13]. However, identifiable structures and targets are prime requisite for safe outcome [14,15]. In present case spinal and epidural anaesthesia were not feasible; as even during fluoroscopy spinal structure could not be identified. General Anaesthesia with relaxant is our second choice with either LMA or endotracheal tube. General anaesthesia (GA) could have been used in this case however; it was not considered as a second choice due to pulmonary hypertension and multiple valvular dysfunctions. She had also features of congestive cardiac failure for which medicines were advised. In this situation GA was not considered safer than regional anaesthesia [16]. Caudal anaesthesia was the safe option in given circumstances provided, successful localization and satisfactory anaesthetic effect is achieved. In present case we used fluoroscopy for localization of caudal space and catheter placement for ensuring successful localization and correct catheter placement to achieve successful block with less amount of local anaesthetic. A recent study of 172 women undergoing minor gynaecologic surgery using caudal anaesthesia with 20 mL of 1.5% lidocaine, the highest sensory dermatome level reached was below T10⁹. We used 20ml of 0.75% ropivacaine to achieve T8 level of sensory block and excellent relaxation to provide comfortable surgical condition. Caudal injection with anatomical landmarks results in high failure rates and requires large dosage of local anaesthesia for desired effect [4,11,17]. Injection without catheter could be a cause of high failure rates of caudal epidural due to escape of drug through sacral foramina [6]. In our case possibly due to abnormal spinal canal and catheter placement higher up in caudal space might have helped to achieve higher block with less amount of local anaesthetic drug. Anaesthesia literature also have mentioned that vaginal hysterectomy can be done under caudal epidural block and if catheter technique is used total dosage of local anaesthesia can be reduced up to 1/3 compared to single injection technique [4]. We report this case because, we could not find similar situation in anaesthesia literature where caudal epidural was used as rescue technique for vaginal hysterectomy when other regional approaches were not feasible and GA was not safe. One report of continuous caudal block with caudal catheterization has been mentioned in literatures for vaginal operation in which catheter was inserted at L5/S1 and guided downwards to achieve caudal epidural anaesthesia [18]. However; we could not find any exclusive

report or literature regarding use of fluoroscopy for successful caudal epidural anaesthesia for vaginal hysterectomy with or without caudal epidural catheter in difficult anatomy of spine.

Conclusion

We used caudal epidural anaesthesia with epidural catheter successfully to manage a case of vaginal hysterectomy in which spinal or lumbar epidural anaesthesia was not feasible due to severe spinal deformity and general anaesthesia was considered unsafe due to cardiac disease.

Limitation of this case report: This case report of single case only suggests that, in clinical scenario wherever, situation is not conducive to either general anaesthesia or commonly used technique like epidural or spinal, caudal anaesthesia can be tried for vaginal hysterectomy. However, this technique is not the first choice because of inconsistent quality of block as suggested in literature. Fluoroscopic guided epidural or spinal can still be tried first if, anatomy of spine is clinically difficult.

Competing interests

The authors declare that they have no competing interests.

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