Case Report

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Anaesthesia Section

Transient Voice Loss after Spinal Anaesthesia for Lower Limb Surgery: A Case Report

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ABSTRACT

Spinal Anaesthesia (SA) with hyperbaric bupivacaine and opioids is a preferred technique for lower limb surgeries in many centres. Among the various complications of such anaesthesia, postprocedural voice loss is relatively uncommon and has been reported very rarely in cases other than parturient patients. The sudden onset of such symptoms after anaesthesia and various other attributable causes may have implications for the subsequent surgery. The authors reported here a case of postprocedural voice loss in a 24-year old male patient prepared for open reduction and internal fixation surgery for a femur fracture. The patient developed immediate dysphonia along with tingling of the face and itching of the nasal alae after the administration of a subarachnoid block. The patient had a normal heart rate, blood pressure, and respiratory pattern. There was no history of any previous episode or possible attributable psychological condition. The authors carefully monitored the patient, assessed various causes of such a presentation, and noticed it to be transient and without any serious implications. They attributed the cause to the rostral spread of fentanyl, and the surgery was resumed. The authors concluded that immediate and transient voice loss after SA is an unexpected and unavoidable complication for lower limb surgery and may occur in non obstetric cases as well. However, if hypovolemia and respiratory abnormalities had been excluded, reassurance and close observation may be appropriate.

Keywords: Aphasia, Fentanyl, Non obstetric, Temporary

CASE REPORT

A 24-year-old, 60 kg male was taken for emergency surgery after sustaining a road traffic accident 12 hours prior. The patient had a mid-shaft femur fracture and was scheduled for an open reduction and internal fixation under SA. There was no history of co-morbidities, addiction, drug allergies, medications, or previous surgeries. The patient was haemodynamically stable, conscious, oriented, and without any other major injuries. Preanaesthetic evaluation for the emergency procedure revealed no abnormality. He had a pulse rate of 84/min, blood pressure of 120/80 mmHg, and respiratory rate of 16/min. After aseptic precautions, a subarachnoid block with 2.5 mL of 0.5% hyperbaric bupivacaine (12.5 mL) and fentanyl 0.5 mL (25 mcg) was administered. The patient experienced throat uneasiness and was unable to swallow with a husky voice approximately 10 minutes after the SA. Subsequently, he lost his voice completely. He also reported tingling on the right side of his face and itching on nasal alae during the painting and draping for the surgery. The patient was promptly evaluated, and a sensory block at the level of T6 without any motor loss in the upper limbs was observed. The lower limbs were completely paralysed. His pulse was 84/min, and BP was 110/84 mmHg. Respiratory rate was 18/min, spontaneous, regular with an End-tidal Carbondioxide ($EtCO_2$) waveform. No changes in vitals or block level were noted after 10 minutes of observation. As the pulse rate, blood pressure, and respiratory pattern were normal, and no contributory or psychological history was identified during preanaesthetic clinical findings, the patient was reassured and not further investigated at that moment, and the surgery resumed.

After 30 minutes, the voice was noted to improve, and by 50 minutes, the voice had returned to normal. The surgery was completed in 120 minutes. The patient was observed for two hours postoperatively and examined after the effects of SA had worn off. The clinical examination did not reveal any neurological abnormalities. The patient was discharged on the 3rd postoperative day without any related symptoms and was followed-up regularly by the Department of Orthopaedics. No related complaints were noted six months later at the patient's last visit.

DISCUSSION

The SA with hyperbaric bupivacaine and opioids is a preferred technique for lower limb surgeries in many centres. Complications such as hypotension, failed SA, subdural block, post-dural-puncture headache, etc., commonly occur after such anaesthesia. However, postprocedural voice change or aphasia as a complication of SA is relatively uncommon and is mainly reported in parturient patients [1]. The chance of postprocedural voice change in non parturients is rare [2,3]. Moreover, the immediate onset of such symptoms after anaesthesia and various attributable causes may have implications for subsequent surgery. The authors report a case of voice change after a subarachnoid block with hyperbaric bupivacaine and fentanyl for femur fracture surgery. They also reviewed the literature concerning such complications.

Various databases such as PubMed, Medline, Embase, and Google Scholar were searched with keywords 'spinal anaesthesia', 'aphasia', 'voice change', and 'voice loss'. Contemporary literature was reviewed in the background of the present case scenario. Informed written consent was obtained from the patient for the utilisation of unanonymised data, and the manuscript was prepared following standard ethical practices.

Various causes involving the afferent, central, or efferent neural pathway may be attributed to a voice change. While anatomical abnormalities involving this pathway, such as Cerebrovascular Accidents (CVA), tumours, and cranial nerve injuries, may cause permanent voice change, temporary voice changes may be implicated in various complications of SA such as cerebral hypotension, hypoxia, Transient Ischaemic Attack (TIA), and anaesthetic agents. High SA, subdural anaesthesia, intrathecal opioids, conversion reaction, reduced Intracranial Pressure (ICP), Transient Ischaemic Attack (TIA), etc., have been implicated in such complications [4,5]. Various causes and associated leading clinical features have

been compiled in [Table/Fig-1] [1,4-9]. Fentanyl, due to its lipophilic property, has a faster rate of rostral spread through Cerebrospinal Fluid (CSF) and affects speech areas and cranial nerves of the brain. As there is rapid clearance from CSF, the effects are temporary and short-lasting [9]. However, immediate postprocedural voice change is relatively uncommon after SA. Transient or long-duration voice changes after SA may have a delayed onset and have been mainly reported in parturient patients earlier [7].

Earlier studies have described such complications and their management. The majority of the symptoms were transient and short-lasting. Reassurance to the patient and close monitoring of vitals thus remain the mainstay for the management of such complications. Identification of the causes and directed management is essential subsequently. The key observations of the literature review have been enlisted and compared with the present study in [Table/Fig-2] [2,5,9-11].

low suspicion as per the patient's preoperative anaesthetic check-up. TIA was excluded in the postoperative and follow-up period with subsequent clinical examinations and investigations. The authors ruled out cranial nerve palsy as a result of brainstem stretching from reduced ICP and subarachnoid anaesthesia, as the onset was too early and spontaneous recovery occurred in a very short duration. Therefore, they concluded that the possible cause would be the blockade of opioid receptors of the CNS due to the rostral spread of fentanyl.

The authors carried on with the surgery with periodic assessment. The surgery was completed without any compromise, and symptoms were completely reversed without any further added intervention. No residual symptoms were noted after reversal and follow-up. The present case also highlighted the transient nature of such complications and the conservative approach for management.

Possible causes	Subdural block [4]	High spinal block [5]	Conversion reaction [1,6]	Reduced ICP due to CSF leakage from puncture site [7]	Transient ischaemic attack (TIA) [8,9]	Intra-Thecal opioids [9]
Associated clinical features	Excessive sensory block	High level of sensory and motor block	Past history of similar symptoms	Common in pregnancy	Old age	Cranial nerve palsy
	Sparing of sympathetic functions	Irregular breathing	Female patients	Delayed onset	Co-morbidities-hypertension, cardiac diseases	Respiratory depression
	Motor weakness	Apnoea	Tingling, numbness	9th to 12th cranial nerve palsy (Vocal cord palsy, Loss of gag reflex, bradycardia etc.,)	Hypercoagulability	
	Respiratory incoordination	Hypotension	Difficulty in swallowing		Loss of vision	
	Profound hypotension	Bradycardia			Hemiparesis	
	Horner's syndrome	Loss of consciousness			Paresthesia	

[Table/Fig-1]: Possible causes of post-Spinal Anaesthesia (SA) voice change and their clinical features [1,4-9].

Author	Procedure	Intrathecal dose	Position	Level of sensory block	Complication	Onset	Duration
Kuczkowski KM and Goldsworthy M 2003 [10]	CSE for labour analgesia	Fentanyl 10 mcg+Bupivacaine 2.5 mg	Sitting	T3	Aphagia and aphonia	4 min	20 min
Ray BR et al., 2012 [9]	SAB for caesarean section	Fenatnyl 25 mcg+Bupivacaine 7.5 mg	Left lateral	T4	Aphonia	10 min	20 min
Gupta B et al., 2014 [2]	SAB for lower limb debridement	Fentanyl 25 mcg+Bupivacaine 12.5 mg	Sitting	T10	Aphagia, Aphonia, Facial tingling	2-3 min	10-15 min
Shah KH and Mehta NH 2016 [11]	CSE for labour analgesia	Fentanyl 10 mcg+Bupivacaine 5 mg	Sitting	T6	Aphonia	12 min	60 min
Manohar M and Bhalotra AR 2019 [5]	CSE for caesarean and arthrotomy	Fentanyl 10 mcg+Bupivacaine 10 mg	Sitting	NM	Aphonia	Few min	90 min
Present case, 2020	SAB for ORIF	Fentanyl 25 mcg+Bupivacaine 12.5 mg	Sitting	T6	Dysphonia, Dysphagia, Facial tingling, Itching over nasal alae	10 min	50 min

[Table/Fig-2]: Comparative findings of our study with the previous studies in literature [2,5,9-11].
CSE: Combined spinal epidural; SAB: Sub arachnoid block; ORIF: Open reduction and internal fixation

The present case highlights the development of sudden-onset dysphonia after SA due to the opioid component of such anaesthesia. The rostral spread of fentanyl and subsequent effect of opioid receptor blockade of the Central Nervous System (CNS) may explain the very transient symptoms in the present case. However, these complications may be observed in obstetric patients due to physiological alterations related to pregnancy. The occurrence of voice change in the present case was immediate and unexpected.

The authors approached in the present case to establish the diagnosis by exclusion of possible causes. They checked the blood pressure, respiratory rate, pattern, and level of sensory-motor block immediately. Ensuring these parameters were normal, a high spinal or subdural block was excluded. Conversion reaction was excluded by confirming the lack of suggestive history from the awake patient on the table. The possibility of TIA could not be excluded with certainty at that moment but was ruled out based on

CONCLUSION(S)

Postprocedural voice change after SA may occur mainly as a result of cranial nerve involvement or the effect of anaesthetic drugs on speech areas of the brain. When this complication is attributed to fentanyl, the voice changes are immediate. Immediate and temporary voice changes as a complication after SA for limb surgery may be unavoidable and encountered unexpectedly. However, in the absence of respiratory abnormalities and haemodynamic changes, the immediate concerns of high SA, TIA, etc., are excluded. In these cases, reassurance, a return to surgery, and close observation may be appropriate. Although these complications are mainly reported in parturient patients earlier, they may occur in other cases, and the present case report may be used as a reference in such scenarios.

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