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Patient with Kyphoscoliosis and Bifid Uvula for Hernioplasty Managed Under Low Dose Spinal Anaesthesia at Sub District Hospital

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ABSTRACT

The management of complex surgical cases often presents unique challenges, particularly when multiple anatomical abnormalities are involved. In this case report, we focus on a 52-year-old male with a bifid uvula and moderate kyphoscoliosis, who was successfully managed for right hernioplasty under low-dose spinal anesthesia at a sub-district hospital. Kyphoscoliosis, characterized by a combination of lateral and forward spinal curvature, often complicates both the surgical and anesthetic approaches due to its impact on respiratory mechanics and the difficulty of achieving adequate spinal anesthesia. The presence of a bifid uvula, while generally a benign condition, adds another layer of complexity as it may be associated with other subtle congenital anomalies that require consideration during perioperative planning. In this particular case, the patient presented with normal cardiovascular and respiratory function, despite his spinal deformity, as evidenced by stable vital signs and clear auscultation findings. However, his kyphoscoliosis posed a significant challenge for the administration of spinal anesthesia. The anesthesiologist employed a paramedian approach at the L2-L3 level using a 25G needle to navigate the distorted anatomy and successfully administered 2.5cc of hyperbaric bupivacaine, achieving a sensory block at the T6-T8 level. The procedure was completed without intraoperative complications and the patient had an uneventful recovery, highlighting the importance of tailored anesthetic techniques in such cases. The successful outcome of this case underscores the critical need for meticulous preoperative assessment and individualized anesthetic strategies in patients with kyphoscoliosis undergoing surgery. The case also contributes to the growing body of literature on the management of spinal deformities in surgical settings, offering valuable insights for clinicians facing similar challenges. Ultimately, this case reaffirms the feasibility of using low-dose spinal anesthesia in patients with complex anatomical variations, provided that careful attention is paid to the technical aspects of the procedure and the unique physiological considerations of the patient.

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Key Words
Kyphoscoliosis, bifid uvula, hernioplasty, low dose spinal anaesthesia

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INTRODUCTION

Kyphoscoliosis, a condition marked by the abnormal curvature of the spine in both the coronal and sagittal planes, affects a significant number of individuals globally, with varying degrees of severity. It is particularly prevalent among adolescents, often linked to idiopathic causes, but can also be associated with congenital or neuromuscular disorders[1]. The condition not only alters the normal spinal architecture but also impacts pulmonary and cardiac function due to the distortion of thoracic anatomy. This presents a unique set of challenges in surgical settings, especially when considering regional anesthesia techniques like spinal anesthesia[2]. The altered spinal anatomy complicates the identification of anatomical landmarks, making the administration of spinal anesthesia more technically demanding and increasing the risk of inadequate anesthesia or complications during surgery[3].

Bifid uvula, though generally a less critical anomaly, can sometimes indicate the presence of other congenital malformations, particularly in the context of syndromes like Loeys-Dietz or submucous cleft palate[4]. While the direct impact of a bifid uvula on anesthesia is minimal, its presence necessitates a thorough preoperative evaluation to rule out associated anomalies that could influence airway management and perioperative care. The combination of kyphoscoliosis and bifid uvula in a surgical patient, therefore, represents a confluence of challenges that requires careful planning and a tailored anesthetic approach to ensure patient safety and procedural success[5].

In the context of hernioplasty, where precise anesthetic control is crucial, these anatomical challenges are particularly pronounced. The risk of inadequate spinal block or unintended spread of the anestheticagent is higher in patients with spinal deformities, making it imperative for the anesthesiologist to modify the technique accordingly[6]. This often involves using alternative approaches, such as the paramedian approach, and employing real-time imaging modalities to increase the accuracy of needle placement. The significance of these conditions, therefore, extends beyond their direct physiological effects, influencing the entire perioperative management strategy and necessitating a high level of expertise and adaptability in the surgical team.

Objective: The objective of this report is to document the successful management of a hernioplasty in a 52-year-old male patient with the dual anatomical challenges of moderate kyphoscoliosis and a bifid uvula. The report aims to illustrate how a tailored anesthetic approach, specifically the use of low-dose spinal anesthesia, was effectively employed to navigate the complexities posed by the patient's spinal deformity and potential congenital anomalies. By presenting this case, the report seeks to contribute valuable insights into the perioperative strategies that can be employed in similar cases, highlighting the importance of individualized care in overcoming significant anatomical and physiological challenges. This case serves as an example for anesthesiologists and surgeons dealing with patients who present with rare combinations of conditions that complicate standard procedural approaches[3-6].

Case Presentation: This case involves a 52-year-old male patient who presented for hernioplasty at a sub-district hospital. The patient's medical history is significant for two distinct anatomical abnormalities: moderate kyphoscoliosis and a bifid uvula, both of which have been present since birth. Despite these congenital conditions, the patient had led a relatively normal life, with no major health issues until the recent onset of symptoms related to an inguinal hernia. His presenting symptoms included localized pain and discomfort in the right inguinal region, which had progressively worsened over the past few months. There were no other associated symptoms such as gastrointestinal disturbances, and his past medical history was otherwise unremarkable, with no history of previous surgeries or significant chronic illnesses.

During the clinical examination, the patient's vital signs were stable. His pulse rate was recorded at 78 beats per minute (bpm), blood pressure was 140/80 mmHg, and respiratory rate was 16 breaths per minute. Systemic examination revealed normal cardiovascular function, with heart sounds S1 and S2 heard clearly and no murmurs detected. Respiratory examination was unremarkable, with clear breath sounds on auscultation and no evidence of respiratory distress, despite the patient's kyphoscoliosis. Neurological examination indicated that the patient was conscious and fully oriented, with no neurological deficits observed. On general examination, the bifid uvula, a congenital anomaly where the uvula is split into two, was noted as a longstanding feature since childhood. The patient also exhibited an abnormal gait, likely due to his spinal deformity, but there were no other congenital anomalies identified upon physical examination.

A series of investigations were conducted to further assess the patient's condition and to guide the perioperative management plan. Routine blood tests, including a complete blood count (CBC), liver function tests (LFT) and renal function tests (RFT), were all within normal limits, indicating no underlying systemic illness. A chest X-ray was performed, which showed crowding of the ribs on the right side, consistent with the patient's kyphoscoliosis, as well as mild haziness that did not correlate with any significant pulmonary pathology. An electrocardiogram (ECG) revealed a heart rate of 70-80 bpm, normal sinus rhythm (NSR),

and left axis deviation (LAD), with no significant ST-T changes, suggesting stable cardiac function suitable for the planned surgical procedure[3-6].

Preoperative considerations for this patient were primarily centered around the challenges posed by his kyphoscoliosis. The spinal deformity significantly alters the normal anatomical landmarks, making regional anesthesia techniques, such as spinal anesthesia, technically more difficult to administer. The abnormal curvature of the spine can complicate the insertion of the spinal needle, increase the risk of suboptimal block levels and potentially lead to uneven distribution of the anesthetic agent, resulting in either insufficient or excessive anesthesia. Additionally, kyphoscoliosis can affect pulmonary function due to the restrictive nature of the deformity, increasing the risk of respiratory complications during and after the procedure[2]. The patient's bifid uvula, while not directly impacting the anesthetic technique, necessitated a thorough airway evaluation to ensure that no other associated anomalies, such as submucous cleft palate, were present, which could complicate airway management[4]. These considerations guided the anesthetic planning, with a focus on minimizing risks and ensuring a safe and effective anesthetic approach tailored to the patient's unique anatomical challenges.

Anaesthetic Management: In managing the anesthesia for this patient, the procedure was meticulously planned and executed to accommodate the complexities posed by his kyphoscoliosis. The patient was positioned in a sitting posture, which is often preferred for spinal anesthesia in patients with spinal deformities as it can help in better aligning the vertebral column, thereby making it easier to access the subarachnoid space[7,3]. The anesthesiologist opted for a paramedian approach, a technique that is particularly advantageous in cases where the midline is difficult to identify due to the curvature of the spine. Using a 25G spinal needle, the insertion was carefully performed at the L2-L3 interspace, which was chosen to optimize the chances of successful block while minimizing the risk of complications associated with spinal deformities[6].

The chosen anesthetic agent was 2.5cc of hyperbaric bupivacaine, a commonly used local anesthetic in spinal anesthesia known for its reliable and predictable spread in the cerebrospinal fluid[2]. The hyperbaric nature of the solution helps in achieving a denser block, particularly important in ensuring adequate anesthesia in patients with altered spinal anatomy. In this case, the sensory block was successfully established at the T6-T8 level, which is appropriate for hernioplasty as it provides sufficient anesthesia for the lower abdominal region without affecting higher thoracic levels, thus reducing the risk of respiratory complications[8].

Despite the thorough preparation, several challenges were encountered during the procedure, primarily due to the patient's kyphoscoliosis. The significant curvature of the spine made it difficult to identify the correct entry point and angle for needle insertion, necessitating multiple attempts before successful dural puncture was achieved. Moreover, the unpredictable spread of the anesthetic in such patients posed a risk of inadequate block, either too high or too low, which could have led to either incomplete anesthesia or complications such as hypotension or respiratory depression if the block extended too high[1,3]. However, by using the paramedian approach and closely monitoring the patient's response during the injection, these risks were effectively managed.

The outcome of the anesthetic management was highly successful. The patient maintained stable intraoperative conditions with no signs of inadequate anesthesia or systemic complications. Continuous monitoring ensured that the block remained at the desired level and there were no significant drops in blood pressure or oxygen saturation, which can sometimes occur with spinal anesthesia, particularly in patients with compromised pulmonary function[4]. Postoperatively, the patient recovered without any adverse effects related to the anesthesia, confirming the effectiveness of the strategy employed. This case highlights the importance of adapting anesthetic techniques to the specific anatomical challenges presented by patients with spinal deformities and the success in this case serves as a valuable reference for managing similar cases in the future.

Surgical Procedure: The hernioplasty procedure for this patient was carefully adapted to accommodate the complexities introduced by his kyphoscoliosis. Given the anatomical distortion caused by the spinal curvature, the surgical team anticipated potential challenges in both patient positioning and access to the inguinal region. The patient was positioned supine with careful padding to maintain spinal alignment as much as possible, minimizing any additional strain on his thoracic region[3]. The inguinal hernia was approached through a standard incision, but the surgical team took extra care to ensure that the operative field was fully accessible despite the patient's abnormal body contour. This required some adjustment in the usual orientation of the surgical instruments and an increased focus on maintaining the sterile field.

The hernia repair was performed using a tension-free mesh technique, which is the standard of care for inguinal hernias. However, due to the patient's spinal deformity, there was an increased awareness of the potential for altered tissue planes and the risk of nerve entrapment, which can be more prevalent in patients with abnormal anatomy[8]. The mesh was carefully placed and secured to avoid any undue pressure on

surrounding structures, and the closure of the wound was meticulous to prevent complications such as hematoma or infection, which could be exacerbated by the patient's altered posture and pressure distribution[9].

Intraoperative management was crucial in ensuring the patient's safety and the success of the procedure. Continuous monitoring of the patient's vital signs was conducted, with particular attention to respiratory function, given the restrictive nature of his kyphoscoliosis[1]. The anesthesiologist maintained close communication with the surgical team, adjusting anesthetic depth and administration as needed to ensure hemodynamic stability throughout the procedure. In addition to standard monitoring, the patient's oxygen saturation and end-tidal CO2 levels were closely observed, as patients with kyphoscoliosis are at increased risk for hypoventilation and hypoxia during surgery[2].

The surgical outcome was positive, with the hernia successfully repaired and no immediate postoperative complications observed. The patient was closely monitored in the recovery room, with specific attention to his respiratory status due to the pre-existing spinal deformity. He remained hemodynamically stable, and there was no evidence of respiratory compromise or other postoperative issues. The patient was discharged with appropriate postoperative care instructions and scheduled for follow-up to monitor the healing process and ensure the continued success of the hernia repair[6]. The meticulous planning and execution of both the surgical and anesthetic management underscore the importance of a tailored approach in patients with complex anatomical challenges.

Postoperative Care and Follow-up: The postoperative care of this patient was focused on ensuring a smooth recovery process while addressing the unique challenges posed by his underlying kyphoscoliosis. Pain management was a key component, with the patient receiving a multimodal analgesic regimen to control postoperative discomfort. This included the administration of non-opioid analgesics and a low-dose opioid for breakthrough pain, tailored to minimize respiratory depression, which could be particularly risky in patients with compromised pulmonary function due to spinal deformities[8]. The patient responded well to this regimen, reporting manageable pain levels and no significant side effects.

During the immediate postoperative period, the patient was monitored closely for any signs of complications. Given his spinal condition, there was an increased risk of respiratory issues, but careful intraoperative and postoperative management ensured that no respiratory complications arose. The surgical site was inspected regularly and there were no signs of infection, hematoma, or other local complications. The patient was mobilized early, which is critical in preventing postoperative complications such as deep vein thrombosis, especially in patients with reduced mobility due to kyphoscoliosis[2].

Follow-up care was conducted at regular intervals to monitor the patient's recovery and ensure the success of the hernia repair. During follow-up visits, the patient reported a steady improvement in symptoms and demonstrated good wound healing with no signs of recurrence. The patient's abnormal gait, attributed to his kyphoscoliosis, did not worsen postoperatively, and his overall recovery trajectory was positive[3]. Long-term prognosis for the patient was favorable, with no anticipated complications related to the hernia repair itself. However, continued monitoring was recommended to manage any potential issues arising from his spinal deformity, particularly regarding respiratory function and mobility, ensuring that any late-onset complications could be promptly addressed[6].

RESULTS AND DISCUSSIONS

The clinical implications of this case are significant for both anesthetic and surgical practice, particularly when managing patients with spinal deformities such as

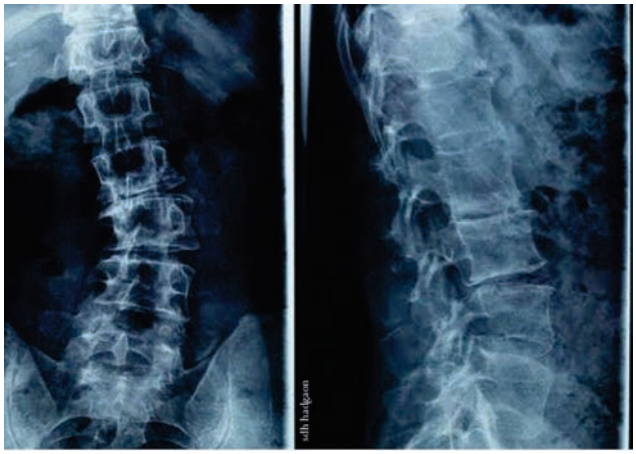

Fig. 1: Curst X ray Examination

Fig. 2: Abnormal curvature of spine

kyphoscoliosis. This case underscores the necessity for meticulous preoperative planning and the importance of employing tailored anesthetic techniques to navigate the complexities presented by abnormal spinal anatomy. Kyphoscoliosis complicates the administration of spinal anesthesia by distorting the usual anatomical landmarks, making needle placement more challenging and increasing the risk of inadequate block or unintended complications such as hypotension or respiratory distress[8,6]. This case demonstrates how a paramedian approach, carefully chosen anesthetic agents and close intraoperative monitoring can lead to successful outcomes even in high-risk patients. The ability to adapt standard procedures to meet the unique needs of patients with complex anatomical variations is essential in ensuring both safety and efficacy in surgical interventions.

In comparing this case with similar reports in the literature, the challenges and outcomes align closely with other documented experiences of managing kyphoscoliosis under spinal anesthesia. For instance, studies have shown that while spinal anesthesia is often preferred in patients with kyphoscoliosis due to the potential respiratory complications associated with general anesthesia, the success of this approach heavily depends on the anesthesiologist's skill in adjusting technique and dosage[2,3]. In this case, the use of a paramedian approach and hyperbaric bupivacaine was particularly effective, consistent with other reports that recommend these adaptations for achieving adequate sensory block in patients with altered spinal anatomy[10]. However, the challenges in this case were compounded by the presence of a bifid uvula, which, while not directly impacting the anesthetic procedure, required a comprehensive preoperative evaluation to rule out associated airway anomalies.

The significance of this case report lies in its contribution to the growing body of evidence supporting the safe and effective management of surgical patients with kyphoscoliosis under spinal anesthesia. It highlights the importance of individualized care strategies and the need for ongoing education and training for anesthesiologists and surgeons in handling such complex cases. By documenting the successful outcomes achieved through careful adaptation of standard techniques, this case provides a valuable reference for future cases where similar anatomical challenges are present[4,6]. It also emphasizes the critical role of interdisciplinary collaboration in managing patients with multiple congenital anomalies, ensuring that all potential risks are addressed and that the patient receives the highest standard of care. As such, this case contributes meaningfully to the literature, offering insights that can improve the management of patients with complex anatomical and physiological conditions in surgical settings.

CONCLUSION

In conclusion, this case report highlights the successful management of a 52-year-old male patient with moderate kyphoscoliosis and a bifid uvula undergoing hernioplasty under low-dose spinal anesthesia. The key findings of this case demonstrate the importance of individualized anesthetic planning and the use of a paramedian approach to effectively navigate the challenges posed by spinal deformities. The administration of 2.5cc hyperbaric bupivacaine resulted in an adequate sensory block at the T6-T8 level and the procedure was completed without intraoperative or postoperative complications. The patient's postoperative recovery was smooth, with no significant pain or respiratory issues and his follow-up visits confirmed a positive outcome.

Based on the lessons learned from this case, it is recommended that anesthesiologists and surgeons dealing with similar patients should prioritize thorough preoperative assessments to identify and plan for potential challenges associated with spinal deformities. The use of imaging techniques to guide needle placement and the careful selection of anesthetic agents are crucial in achieving successful outcomes. Additionally, early mobilization and vigilant postoperative monitoring are essential in preventing complications and ensuring optimal recovery. This case underscores the importance of tailored anesthetic techniques and interdisciplinary collaboration in managing patients with complex anatomical variations, offering valuable insights for future clinical practice.

REFERENCES

1. Baydur, A., and E.J. Milic, 1993. 1. Respiratory mechanics in kyphoscoliosis. Mon Che Dise., 48: 69-79.
2. Holmström, B., K. Laugaland, N. Rawal and S. Hallberg, 1993. Combined spinal epidural block versus spinal and epidural block for orthopaedic surgery. Can. J. Anaesth., 40: 601-606
3. Gandhi, S.B. and S. Boro, 2019. 1. Case report of successful spinal anaesthesia in a patient with kyphoscoliosis for hernioplasty. Inter Jou Scie Res., 8: 1639-1641
4. Schwartz, J.J., 2010. 1 Skin and Musculoskeletal Diseases. In Anaesthesia and Co-Existing. 5th Edn., Saunders Elsevier., Philadelphia, ISBN-13: 9780323718615, Pages: 505
5. Ramez, S.M. and A.J. Klowden, 1994. 1. General Anaesthesia. In: Anaesthesia for Orthopaedic Surgery., Ramez, S.M. and A.J. Klowden, (Eds.)., Churchill-Livingstone, U.S.A., ISBN-14: 978-0781701655, pp: 23-28
6. Kokane, D.M. and P. Hingole, 2015. 1. Spinal anaesthesia in a case of kyphoscoliosis. Inter Jour Adva Med., Vol. 2, No. 1

7. Oksun, K., S.L. Sang, J.Y. Tae, H.L. Yun and H.Y. Jun, 2008. 1. Combined spinal-epidural anaesthesia in a patient with severe thoracic kyphoscoliosis. Kore Jour Anae., Vol. 54, No. 4
8. Micheal, K.U. and L. Salim, 2009. 1. Muscle Diseases. In: Anaesthesia and Uncommon Disease., Micheal, K.U. and L. Salim, (Eds.)., Lee A Fleisher., Pennsylvania, ISBN-18: 13. 978-1437727876, pp: 144-145
9. Veliath, D., R. Sharma, R. Ranjan, C.R. Kumar and T. Ramachandran, 2012. Parturient with kyphoscoliosis (operated) for cesarean section. J. Ana Clin. Pha., 28: 124-126
10. Kim, O., S.S. Lee, T.J. Yoo, Y.H. Lim and J.H. Yon, 2008. 1. Combined spinal-epidural anaesthesia in a patient with severe thoracic kyphoscoliosis. Kore Jour Ana., Vol. 54, No. 4