

## **Anesthetic Choice and Management in Cesarean Section for a Patient with Post Laminectomy and Inferior Stabilization: A Case Report**

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### **ABSTRACT**

**Background:** Deciding the choice of anesthetic choice and management for a cesarean section is a relatively complex procedure. In this case report we examine a patient undergoing cesarean section who has a significant history of laminectomy with inferior stabilization, the complexities of the patient's conditions may influenced the choice of anesthetic strategy.

**Case:** A 29-year-old female patient undergoing a cesarean section with a complex medical history, including two previous cesarean sections and a laminectomy with inferior stabilization, presenting unique challenges in obstetric and anesthetic care. The patient was admitted to K.M.R.T Wongsonegoro Hospital, Semarang, at 40 weeks of gestation, with symptoms of intense abdominal tightening, active fetal movement, and bloody mucus. Her medical history was further complicated by a laminectomy with inferior stabilization performed in 2019.

**Discussion:** Laminectomy and inferior stabilization is one of the choice treatments for bone tuberculosis. Laminectomy is a surgery that creates space by removing bone spurs and tissues associated with spondylosis of the spine and adding Inferior stabilization to maintain the space. In our patient with complex post-laminectomy and lumbar inferior stabilization, it caused anatomical and neurological changes in the patient. The patient was going to have a cesarean section because the time is nearly expected to be the delivery date of her third pregnancy. Because of the complex background of her past laminectomy surgery, we decided to use the general anesthesia technique for this cesarean section.

**Conclusion:** In this case report we can reaffirm that this case contributes to the medical community's understanding of managing cesarean sections in patients with previous spinal surgeries and underscores the need for evolving clinical guidelines and practices in obstetric anesthesia to enhance patient care and safety. The case is a valuable addition to the literature, providing insights for healthcare professionals in similar complex scenarios.

**Keywords:** anesthesia; cesarean section; general anesthesia; inferior stabilization; laminectomy

## INTRODUCTION

This case report details the intricate clinical and surgical management of a 29-year-old female patient, admitted to the emergency department in her 40 weeks of gestation, presented with symptoms including intense abdominal tightening, active fetal movement, and the presence of bloody mucus. Her medical history was significant, encompassing two prior cesarean sections in 2019 and 2020, as well as a laminectomy with inferior stabilization performed in 2019. This complex history of spinal surgery posed significant challenges in the management of her cesarean section, necessitating careful consideration of various clinical factors. The complexities in this case were multifaceted, involving the integration of her obstetric and surgical histories.<sup>1,2</sup>

The presence of altered spinal anatomy from the previous laminectomy and stabilization surgery significantly influenced the anesthetic strategy and surgical approach. The typical preference for regional anesthesia in cesarean sections was reconsidered due to the potential risks associated with spinal manipulation in the context of her previous spinal procedures. Her past medical history also included the successful treatment of tuberculosis (TB) of the bone confirmed done by the internist in April 16 2020, adding another layer to her clinical profile. The case highlights the importance of a comprehensive and multidisciplinary approach, involving obstetricians and anesthesiologists, to navigate the complexities presented by the patient's unique medical history. Clinical examinations, laboratory findings, and magnetic resonance imaging (MRI) results were instrumental in formulating a tailored management plan. This report aims to dissect the decision-making

process in such a complex scenario, emphasizing the anesthetic challenges and the critical need for careful planning and coordination in managing a cesarean section in a patient post-laminectomy with inferior stabilization.<sup>3,4</sup>

## CASE

A 29-year-old female patient was brought to the emergency department of K.M.R.T Wongsonegoro Hospital, Semarang, with primary complaints of intense abdominal tightening since the previous night. She was in her third pregnancy, at 40 weeks of gestation, reporting active fetal movement, no amniotic fluid leakage, and the presence of bloody mucus. Her last menstrual period was on December 17, 2022, with an expected delivery date of October 3, 2023. The patient had no other complaints. Past medical history revealed no instances of hypertension or diabetes. She had similar complaints in 2019 and 2020. There was a confirmed history of TB of the bone, for which she had completed treatment in April 16 2020 and there are no clinical symptoms present currently. Her family history negated similar complaints, hypertension, diabetes, or TB. The patient had completed treatment for bone TB and took supplements and vitamins during pregnancy. Her immunization history included unknown tetanus toxoid (TT) immunization status and two COVID-19 vaccinations plus one booster. Menstrual history indicated her first menstruation at age 13, with a regular 30-day cycle and a period lasting 5-6 days. Obstetric history included regular antenatal care visits (9 times) with a primary care center and obstetrics and gynecologist. Her first child, a girl, was born in December 2019, weighing 1600 grams. She was delivered preterm at 30 weeks via cesarean section due to bone TB and inferior stabilization.

At the time, the patient was continuing to take medication for bone TB, the anesthesia choice was general anesthesia. Her second child, a boy, was born in December 2020, weighing 3100 grams, and was delivered at term via cesarean section due to a history of cesarean delivery, the medication for bone TB was confirmed successful, and the anesthesia choice was general anesthesia. The mother had undergone two cesarean sections in December 2019 and December 2020 and a laminectomy with inferior stabilization in April 2019.

Physical examination on October 3, 2023, revealed a moderately ill appearance, full consciousness (GCS: E4 V5 M6 = 15), normal nutritional status, blood pressure of 120/70 mmHg, pulse rate of 83 beats per minute, respiratory rate of 20 breaths per minute, and a temperature of 36.5°C. Systemic examination showed normal findings in the head, neck, lungs, and heart. Abdominal examination revealed positive linea nigra and striae, fetal heart rate of 144 beats per minute, fundal height of 30 cm, and a single fetus in position with the head not yet engaged. Her extremities were warm with no edema, cyanosis, or delayed capillary refill time. Neurological status was intact, with normal cranial nerve function and physiological reflexes. There were no signs of meningeal irritation, and motor examination showed normal muscle tone and strength.

Supporting examinations included laboratory tests showing high calcium 1.7 mmol/L (n: 1.00 – 1.15 mmol/L) and high leukocyte levels 11.9 /uL (n: 3.6 – 11.0 /uL) and low urea 11.8 mg/dl (n: 17.0 – 43.0 mg/dl), low APTT 23.9 second (n: 26.0 – 34.0 second), low hemoglobin 11.2 g/dL (n: 11.7 – 15.5 g/dL), low hematocrit 34.70 % (n: 35 –

47 %), and low PT values 9.2 second (n: 11.0 – 15.0 second). An MRI conducted on April 1, 2019, before doing the first cesarean section, revealed TB spondylosis at L3-L4. The working diagnosis was a third pregnancy after two cesarean sections with lumbar III - IV TB spondylosis. Treatment involved general anesthesia, premedication, and postoperative care with various medications, including antibiotics, diuretics, pain relievers, and vitamins.

## DISCUSSION

In this case report, we examine the management of a 29-year-old female patient undergoing cesarean section who has a significant history of laminectomy with inferior stabilization. This situation presents distinct challenges, especially regarding anesthesia selection and administration due to the complexities associated with her previous spinal surgery. Numerous critical factors influence the decision to utilize general anesthesia in this context, each warranting a detailed discussion in light of contemporary medical literature and epidemiological data. The choice between regional and general anesthesia for cesarean sections for people with a history of spinal surgery remains a topic of extensive discussion in the medical community. Regional anesthesia is often favoured for its safety profile and advantages in postoperative pain management. However, its use in patients with a history of spinal surgery, like in this case, is more complex. Altered spinal anatomy and the possibility of adhesions resulting from previous surgeries can render the placement of a regional block technically challenging and increase the risk of complications. The incidence of spinal surgery in the general population has been increasing, with laminectomy procedures being relatively standard.<sup>5,6</sup>

The epidemiology of patients undergoing cesarean sections after spinal surgery is an area that's increasingly relevant due to the rising trends in both spinal surgeries and cesarean deliveries worldwide. In reviewing global epidemiological data relevant to our case of the 29-year-old patient with a history of laminectomy and inferior stabilization, there are noticeable differences in the rates of lumbar spinal stenosis surgeries, including laminectomies and cesarean sections across various regions like the United States, Europe, Asia, Southeast Asia, and Indonesia. In the United States, the prevalence of lumbar spinal stenosis surgery, including laminectomy, is reported at 137.4 per 100,000 adults. This rate suggests a considerable proportion of the population potentially undergoing cesarean sections post-spinal surgery. In Europe, the incidence of spinal surgery varies by country. According to Eurostat data, countries such as Germany and Switzerland show higher rates of spinal surgery. Simultaneously, the prevalence of cesarean sections in certain European countries exceeds 25%, with Italy and Portugal among those with higher rates.<sup>7,8</sup>

Asia's scenario is characterized by a rising trend in spinal surgeries, with countries like China and Japan reporting increases, primarily due to ageing populations and surgical advancements. The cesarean section rates in Asia vary, with some countries, including China, recording rates up to 36.7%. In Southeast Asia, the documentation of spinal surgery prevalence needs to be more comprehensive, but it is believed to be increasing, particularly in more developed nations. The cesarean section rates in Southeast Asia are varied, with Thailand and Vietnam reporting rates

above 30%. Indonesia, forming a part of Southeast Asia, displays a lower prevalence of spinal surgeries than Western nations. However, these rates are rising with advancements in healthcare and medical technology. The cesarean section rate in Indonesia stands at about 17%, which is relatively higher than in some other countries in the region.<sup>9,10</sup>

Managing a cesarean section in a patient with a history of laminectomy and inferior stabilization presents a unique set of challenges, particularly from an anesthesia standpoint. Anesthetizing patients with prior spinal surgeries, such as laminectomy, requires careful consideration due to the altered anatomy and potential presence of scar tissue in the spinal region. This alteration significantly complicates the administration of regional anesthesia, a common choice for cesarean sections. The risks of dural puncture or inadequate anesthesia are heightened, and accurately locating the appropriate interspace for needle insertion becomes more challenging. Consequently, in such cases, the anesthesiologist may lean towards general anesthesia despite its inherent risks, including challenges in airway management due to pregnancy-related physiological changes and the increased risk of aspiration. In our case, general anesthesia was chosen due to the patient's surgical history. There are anatomical changes in the bones due to inferior stabilization and some neurological changes that affect motoric strength. This decision aligns with the recommendations which noted that general anesthesia might be the preferred choice in some instances involving complex spinal histories. Given the patient's surgical history. This decision aligns with the recommendations who noted that general anesthesia might be

the preferred choice in some instances involving complex spinal histories. General anesthesia circumvents the technical difficulties and potential neurological risks associated with performing a regional block in altered spinal anatomy.<sup>11,12,13</sup>

The complexities extend beyond the choice of anesthesia type. For instance, general anesthesia in pregnant patients necessitates meticulous attention to airway management. Pregnancy-induced physiological changes can lead to a predisposition towards challenging airway scenarios. This necessitates preparation with appropriate airway management equipment and expertise, especially in emergency settings requiring rapid sequence induction. Additionally, the positioning of the patient during the cesarean section is a crucial aspect that needs careful consideration. The anesthesiologist must work closely with the surgical team to ensure a position that is safe for both the cesarean procedure and the spinal surgery site. Postoperative pain management in such patients is another area that demands a specialized approach. Given their history of spinal surgery, these patients may have altered pain thresholds or pre-existing chronic pain issues. It becomes imperative to tailor the postoperative pain management strategy, often employing a multimodal approach that includes opioids, NSAIDs, and other analgesics. This strategy must be balanced with the patient's existing pain management regimen, considering the effects on postoperative recovery and breastfeeding.<sup>14,15</sup>

The perioperative period also requires vigilant neurological monitoring. Any changes in sensation, strength, or reflexes post-surgery could indicate spinal cord or nerve root compression,

potentially exacerbated by the surgery. Early detection of such changes is critical to preventing long-term neurological deficits. The anesthesiologist's role extends beyond the operating room in such complex cases. It encompasses preoperative planning, intraoperative management, and postoperative care, requiring close collaboration with obstetricians and spine surgeons. This interdisciplinary approach is crucial in anticipating potential complications and devising risk mitigation strategies.<sup>16,17,18</sup>

Additionally, patient education and informed consent play a pivotal role. Patients should be thoroughly informed about the increased risks and potential complications associated with their unique situation, including discussions about anesthesia options and possible surgical and postoperative complications. The management of such cases requires a comprehensive approach that involves understanding the patient's surgical history and awareness of the latest trends and developments in anesthesia and surgical techniques. It is essential to tailor the anesthetic plan to the patient's individual needs while considering the potential implications on maternal and fetal outcomes. As the intersection of spinal surgeries and cesarean sections becomes more common, there is a pressing need for updated guidelines and research focusing on the best practices for managing these complex cases. This case report enriches the existing body of medical knowledge by elucidating the critical considerations and the decision-making framework employed in administering general anesthesia for a cesarean section, particularly in a patient with a prior history of laminectomy and inferior stabilization.<sup>19,20,21</sup>

## CONCLUSSION

This case report of a 29-year-old female with a significant medical history of laminectomy and inferior stabilization, sheds light on the complex challenges and critical decision-making involved in anesthesia management. The patient's intricate history, including her third pregnancy post two cesarean sections and a past spinal surgery, necessitated the choice of general anesthesia over regional techniques. This decision underscores the importance of individualized anesthetic approaches in patients with complicated spinal histories. In this case, general anesthesia was chosen as a safer alternative, given the patient's surgical history. This decision aligns with the recommendations who noted that general anesthesia might be the preferred choice in some instances involving complex spinal histories. The case further exemplifies the need for multidisciplinary collaboration involving obstetricians and anesthesiologists to navigate the nuances of such complex medical scenarios effectively. It emphasizes the vital role of comprehensive preoperative evaluations, meticulous intraoperative management, and diligent postoperative care. The insights gained from this case contribute to the medical community's understanding of managing cesarean sections in patients with previous spinal surgeries. They highlight the ongoing need for evolving clinical guidelines and practices in obstetric anesthesia to enhance patient care and safety in similar challenging situations. This report, therefore, stands as a valuable addition to the existing literature, providing a framework for healthcare professionals to address similar cases in the future.

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