



# Anesthetic Management of a Parturient with Sequelae of a Severe Burn Injury

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Anesthetic management during labor and delivery of a parturient after severe burn injury presents many unique challenges. We report the case of a 25-year-old parturient with a history of 85-90% total body surface area burn in 2002, who presented for a pre-delivery anesthesia evaluation. We outline the management plan that was devised and resulted in adequate labor analgesia. There are a few cases in the literature reporting the use of an epidural catheter for labor analgesia and possible Cesarean section in post-burn patients. We suggest that it is important to perform a thorough assessment of post-burn parturients prior to the onset of labor. This assessment is useful in revealing potential limitations and complications that could arise during labor and delivery; thus allowing preparations to be made for interventions that may become necessary.

**Keywords:** epidural analgesia, burns, pregnancy

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## Introduction

Pregnant patients with a history of burns present a challenge to providing obstetrical anesthesia. While there are many case reports presenting the management of patients suffering from burns during pregnancy, there are few reports of obstetrical anesthesia in the post-burn patient. The incidence of burn injury in the United States is greater than 450,000 per year [1]. Pregnant patients account for 6.8-7.8% of admissions for thermal injury and have an increased mortality rate of 63% when the total body surface area burn is 25-50% [2].

The trauma of a burn injury can result in significant scarring, inhalation injury, contractures, amputations and many other long-term complications. These anatomical changes in association with an incidence of failed intubation that is eight times higher in the obstetrical patient compared to the general population further complicates airway access in these patients [3]. Therefore, it is critical to develop an anesthetic plan that minimizes risks, allows for adequate intravenous (IV) access and reduces the need for intubation in these patients.

## Case report

A 25-year-old nulliparous parturient at 32 weeks of gestation with a history of 85-90% total body surface area burn secondary to a house fire 14 years prior presented for pre-delivery anesthesia evaluation. Her burns were mostly third degree with some areas of fourth degree resulting in scarring and contractures on her face, neck, thorax, upper part of abdomen and back, arms and upper thighs to foot. Her scalp was spared and she had partial sparing of her face, lower back, upper thigh, legs and umbilicus to groin region (Figure 1). Her burn injuries also resulted in bilateral arm amputations.

On physical exam, her pulse was 90 beats per minute, respiratory rate of 18 breaths per minute and blood pressure of 129/70 mmHg. Her breath sounds were clear on auscultation bilaterally. Her cardiac exam revealed normal heart sounds with no murmurs. The airway exam was significant for a restricted mouth opening of 3 cm, thyromental distance of 5 cm, limited neck extension, and Mallampati IV. All spinous processes were palpable under scar tissue on back examination.



**Figure 1.**  
Epidural catheter placement in a 25-year-old parturient with a history of 85-90% total body surface area burns.

The patient presented at 40 weeks gestation for induction of labor secondary to intra-uterine growth retardation with minimal flow on umbilical Doppler. Due to bilateral arm amputation and difficult IV access, a central line was placed through the right femoral vein after multiple attempts at placing an internal jugular central line were unsuccessful. Once IV access was secured, the patient received an epidural catheter that could be used for labor analgesia and surgical anesthesia in case an emergent Cesarean section became necessary.

A 19 gauge epidural catheter was placed using a 17 gauge Tuohy needle in the L4-L5 interspace. The catheter was left inserted at 5 cm greater than the length of the Tuohy needle insertion. A test dose of Lidocaine 1.5% with epinephrine 1-to-200,000 was negative for signs of intrathecal placement. The patient was then given a 4 mL followed by 5 mL bolus of 0.0625% bupivacaine and 3 mcg/mL fentanyl. Her labor epidural analgesia was maintained using the same solution at a rate of 12 mL/hr.

The fetus was delivered using vacuum assisted delivery due to a non-reassuring fetal heart rate. The delivery was complicated by a third degree laceration that was repaired using anesthesia provided through the labor epidural catheter. Post-partum, the epidural catheter was removed and the patient was satisfied with her pain control during labor, delivery and laceration repair.

## Discussion

The anesthesia delivery plan in this patient population should address preparation for acquiring IV access, anesthesia during emergent or elective Cesarean section and maintaining the airway. The plan for this patient included IV access through the feet with a secondary option of central venous access through the femoral vein due to bilateral arm amputations. In anticipation of a difficult intubation, an epidural catheter placed early in the labor period was preferable for use in the event of an emergent Cesarean section rather than exposing the patient to the risks of intubation under general anesthesia. In the event of an emergent Cesarean section, 2% lidocaine or 3% chloroprocaine could have been injected into the epidural space through the epidural catheter to provide rapid adequate surgical anesthesia. In order to reduce the need for intubation, the plan for an elective Cesarean section included either spinal anesthesia or combined spinal and epidural anesthesia.

Regional anesthesia is the method of choice for labor pain control in patients with a difficult airway. However, should hemodynamic instability arise, one must be prepared to intubate the patient if necessary in order to protect the mother and fetus from damaging effects of poor oxygenation [4]. The plan for intubation in this patient included having difficult airway cart and video laryngoscopy easily accessible.

## Conclusion

Post-burn pregnant patients present a unique challenge to providing obstetrical anesthesia. These challenges may include difficult IV access, poor neck extension, altered oral anatomy, positioning problem from contractures. These challenges can effect safe accomplishment of both regional and general anesthesia. It is important to individualize anesthesia plans to each patient and be prepared for all possible complications that could arise.

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