

# Sciatic Nerve Block in the Popliteal Fossa Using Lateral Approach in an Infant with Goldenhar Syndrome

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**Abstract:** Goldenhar syndrome is a rare disorder characterized by a wide range of congenital malformations that may cause difficulty in tracheal intubation and mask ventilation. We describe a case of a male infant with Goldenhar syndrome successfully treated with general anesthesia with laryngeal airway mask and peripheral nerve block for club foot disease surgery.

**Keywords:** Difficult airway, Goldenhar syndrome, Pediatric regional anesthesia, Peripheral nerve block.

## 1. INTRODUCTION

Goldenhar syndrome was first described by Dr. Maurice Goldenhar in 1952. It affects predominately males and it usually presents with cleft palate, malar and mandibular hypoplasia, micrognathia, deafness and cervical vertebral hypoplasia [1]. Due to the airway and facial anomalies, tracheal intubation and mask ventilation may be difficult [2]. In cases with difficulty in airway management, regional anesthesia is generally used in combination with general anesthesia to reduce the anesthetic depth and the risks associated with deeper anesthetic planes, lower airway instrumentation such as laryngoscopy, as well as the need for respiratory assistance, muscle relaxants and opioids [3-5]. Regional anesthesia provides also other advantages like smoother and more comfortable emergence and faster wake-up times which represent a challenge in syndromic patients with potential difficult airway management [6]. We describe a case of Goldenhar syndrome undergoing orthopedics surgery treated with sciatic nerve block through lateral approach at our institution.

## 2. CASE REPORT

A five-months old, 5kg, Caucasian male with Goldenhar Syndrome was scheduled for unilateral club foot disease surgery (left side). The child had cerebral ventricular dilatation, thyroid hypofunction, kidney and urinary tract malformations. He was previously operated for hypertrophic pyloric stenosis and interventricular sept defect. There was information about difficulty in tracheal intubation but not in mask ventilation in both operations. We decided to perform sciatic nerve block through lateral approach under general anesthesia with laryngeal mask airway (LMA).

Special attention was paid to the possibility of difficulties in airway management and an emergency airway cart was

available in the operating room. Anesthesia was induced with sevoflurane 8% in 50% O<sub>2</sub>/Air and a size 1 LMA was used to secure the airway. Anesthesia was maintained with sevoflurane at 1 MAC and the lungs ventilated with assisted ventilation. We then performed a sciatic nerve block in the poplitea fossa through lateral approach using a nerve stimulator (Stimuplex; B Braun, Melsungen, Germany). We identified the superior margin of the kneecap and the dome between the femoral biceps and the vastus lateralis muscles, a 22 G (35 mm) needle (Stimuplex needle B. Braun Melsungen, Germany) was inserted at 2.5 cm cranially the crossing point between the superior margin of the kneecap and the dome [7,8]. The correct needle placement was identified when an output <0.5 mA elicited a characteristic plantar dorsiflexion. A total volume of 2.5 ml (2.5 mg/kg) of levobupivacaine 0.25% was injected. We used a nerve stimulator because ultrasound was not available at our institution [9,10]. Anesthesia lasted for 30 minutes during which the patient's course was uneventful. He was observed in the Post Anesthesia Care Unit for 30 minutes and transferred to the surgical ward with an Aldrete score  $\geq 8$  [11,12]. Pain and motor blockade were evaluated using the CRIES scale [13] and the Bromage score [14] respectively. CRIES score was 2 at the arrival in the Post Anesthesia Care Unit, 1 at 15 and at 30 minutes after surgery. The Bromage value was 3 at the end of the procedure, 1 and 0 at 15 and 30 minutes respectively after surgery. No postoperative complications occurred. The child was discharged the day after in good and stable condition.

## 3. DISCUSSION

We report a case of Goldenhar syndrome successfully treated with a combination of general anaesthesia with LMA and peripheral nerve block for club foot disease surgery [15]. Peripheral nerve blocks are safe in children even though they are not widely used as central blocks [16] which, however, are not free from complications as reported by large studies conducted in France [17-20]. They also reduce anesthetic depth and lower airway instrumentation such as laryngo-

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scopy, as well as the need for respiratory assistance, muscle relaxants and opioids [10, 17-18]. In our case, we preferred the lateral approach to maintain the patient in the supine position, thus without compromising the safety of the airway, as previous difficult intubation has been reported [21]. This choice moreover, allowed us to use the LMA to secure the airway, offering many advantages over tracheal intubation, such as extubation and smooth emergence from anesthesia. [22] Sciatic nerve block for foot and limb surgeries in children is widely used [23,24], generally through the posterior approach. [25,26] We performed the block using a nerve stimulator technique, as we have not enough experience with ultrasound. However, we agree with other experts who consider ultrasound-guided peripheral nerve blockade more efficient, less painful, and more successful than landmark and nerve stimulation techniques. [7, 27-29] We have already started to perform peripheral nerve blocks in children using nerve stimulator together with ultrasound which may increase the success rate comparing to nerve stimulator alone [30]. Ultrasound may also improve the ability of the anesthesiologists, especially those who do not perform regional anesthesia routinely, to identify the neural structures, place the block needle in close proximity to the target and precisely administer optimal volumes of local anesthetic [31,26]. However, the American Society of Regional Anesthesia Evidence-Based Medicine Assessment has found no evidence of any safety advantages for ultrasound over nerve stimulator in regard to major complications such as persistent neurological injury or systemic local anesthetic toxicity [32]. At our institution we perform peripheral blocks generally using ropivacaine 0.2% or levobupivacaine 0.25% as local anesthetics. As known, in fact, ropivacaine and levobupivacaine [S-enantiomers] are less toxic than racemic bupivacaine [33-36]. In this case we used levobupivacaine 0.25% at the dosage of 0.5 ml/kg [37] which provided good postoperative analgesia, reduced the need of administering other drugs such as opioids lowering the risks associated with them especially in a child with compromised airway.

#### 4. CONCLUSION

Pediatric regional anesthesia is an universally applied technique in the daily clinical practice. It has a good safety profile and it can offer several advantages. In particular, in this case of Goldenhar syndrome with the possibility of difficulty in airway management, it provides more comfortable emergence and faster wake-up times reducing anesthetic depth and airway instrumentation.

#### CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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