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Difficult Vascular Access for MRI Sedation in a Child With Blue Rubber Bleb Nevus (Bean) Syndrome: A Case Report

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ABSTRACT

Blue Rubber Bleb Nevus Syndrome (BRBNS) is a rare vascular disorder characterized by multiple venous malformations affecting the skin, gastrointestinal tract, and occasionally the airway or spine. These lesions can complicate anesthetic management due to bleeding risk, potential airway involvement, and difficult vascular access. We report the case of a 12-year-old girl (33 kg, ASA II) presenting with a venous malformation of the left forearm who required MRI under general anesthesia. Multiple failed attempts at intravenous access on the upper limbs led to successful cannulation of the left great saphenous vein using a 22-gauge catheter. Induction was achieved with sevoflurane 6% followed by co-induction with propofol 80 mg and fentanyl 40 µg. A size 3 laryngeal mask airway was inserted, and anesthesia was maintained with sevoflurane 2% in oxygen/air for a 30-minute MRI. The procedure and recovery were uneventful, without bleeding or airway complications. This case underscores the importance of preoperative lesion mapping, avoidance of puncturing vascular malformations, and the value of distal or ultrasound-guided access when upper-limb sites are affected. Inhalational induction remains an effective and atraumatic strategy for securing intravenous access in children with BRBNS undergoing MRI.

KEYWORDS

Blue Rubber Bleb Nevus Syndrome ; venous malformation ; pediatric anesthesia; difficult vascular access; MRI.

MAIN ARTICLE

INTRODUCTION

Blue Rubber Bleb Nevus Syndrome (BRBNS) is a rare venous malformation disorder characterized by multiple compressible, bluish lesions of the skin and viscera, most frequently affecting the gastrointestinal tract, sometimes the airway or spine. Somatic TEK (TIE2) mutations are implicated in its pathogenesis [1].

The anesthetic management of patients with BRBNS is complex due to the potential for mucosal, airway, and spinal involvement and the risk of bleeding during instrumentation [1]. Children often require MRI examinations under sedation or anesthesia to ensure immobility. Strict adherence to pediatric monitoring and discharge standards is essential [2].

This report describes a 12-year-old girl with BRBNS and difficult vascular access undergoing MRI under general anesthesia, followed by a focused review of peri-anesthetic considerations.

CASE REPORT

A 12-year-old girl weighing 33 kg (ASA II) was scheduled for MRI of the left upper limb to evaluate a venous malformation involving the left forearm. The patient presented with multiple cutaneous venous lesions consistent with Blue Rubber Bleb Nevus Syndrome. Pre-anesthetic evaluation revealed no signs of difficult mask ventilation or intubation. Airway anatomy was normal, and cardiopulmonary examination was unremarkable. The patient had no history of bleeding or transfusion. Laboratory investigations showed a hemoglobin level of 11.2 g/dL, with normal platelet count and coagulation profile.

Because of the presence of multiple skin lesions, establishing peripheral intravenous access proved challenging (figure1). Several unsuccessful attempts were made on the right upper limb before a 22-gauge catheter was successfully inserted into the left great saphenous vein under aseptic conditions (Figure 2).

Anesthetic management was conducted under standard monitoring with pre-oxygenation. Induction was achieved by inhalation of sevoflurane at 6% in an oxygen/air mixture. Once an adequate anesthetic depth was obtained, co-induction was performed with intravenous administration of propofol 80 mg and fentanyl 40 µg. A size 3 laryngeal mask airway was inserted easily, and anesthesia was maintained with sevoflurane at 2% in oxygen/air while preserving spontaneous ventilation.

The MRI procedure lasted approximately 30 minutes and was completed without any intraoperative incidents. No bleeding or airway complications were observed. The patient recovered smoothly, maintaining stable hemodynamic parameters, and achieved full awakening in the recovery area. She was discharged after standard postoperative observation.

DISCUSSION

BRBNS is characterized by multifocal venous malformations that may involve cutaneous, gastrointestinal, or other visceral organs [1,3]. Although airway involvement is uncommon, it must be assessed before anesthesia. Vascular lesions of the extremities may complicate IV access, as observed in this case.

The main anesthetic challenges include difficult venous access related to the distribution of vascular lesions, a risk of bleeding if lesions are punctured or compressed, possible airway malformations requiring careful manipulation to avoid trauma, and anemia from chronic bleeding [4].

Recent literature emphasizes the importance of meticulous **preoperative mapping of vascular lesions** and strict **avoidance of invasive procedures through affected areas** to prevent bleeding or tissue injury [5]. When peripheral venous access is difficult, **alternative or distal sites**, such as the **great saphenous vein**, or **ultrasound-guided cannulation** should be considered.

Moreover, **inhalational induction** provides a painless and controlled environment for intravenous placement, minimizing patient movement and reducing the risk of trauma during cannulation [1].

For this 12-year-old, the combination of sevoflurane induction, co-induction with propofol and fentanyl, and LMA provided optimal immobility for MRI while maintaining spontaneous breathing. Pediatric sedation standards from AAP/AAPD mandate continuous pulse oximetry and capnography, trained personnel, and readiness for airway rescue [6,7].

Our case demonstrates that, with appropriate planning, even children with complex venous malformations can safely undergo MRI anesthesia without complications.

CONCLUSION

Children with BRBNS and difficult vascular access can safely undergo MRI anesthesia when careful lesion mapping, inhalational induction, and ultrasound- or alternative-site IV placement are applied. Sevoflurane-based induction with co-induction using propofol and fentanyl, followed by LMA maintenance, provides stable conditions and rapid recovery.

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FIGURES:



Figure 1. Multiple cutaneous venous lesions of the upper limbs in a 12-year-old girl with Blue Rubber Bleb Nevus Syndrome.



Figure 2 : Peripheral intravenous access (22 G) placed in the left great saphenous vein of a 12-year-old girl with Blue Rubber Bleb Nevus Syndrome.

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