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# Anaesthetic Challenges in the Management of a Giant Posterior Neurofibroma Extending from C6 to L3: A Case Report

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**Abstract: Giant neurofibromas of the back are uncommon and present unique perioperative challenges, particularly for airway management and intraoperative positioning. We report a case of a giant neurofibroma extending from the C6 to L3 vertebral level, weighing 9 kg after excision, in a 51-year-old male patient. The posterior location and size of the mass made positioning for laryngoscopy and intubation difficult. After successful intubation, the patient was placed prone, but the mass effect of the neurofibroma caused the head to deviate laterally, making it difficult to maintain a neutral position; this was overcome by stabilising the head with adhesive strapping (Dynaplast). Excision was associated with significant blood loss of approximately 2500 mL, which was managed with 3000 mL of crystalloid, 3 units of packed red blood cells and 3 units of fresh frozen plasma, with stable haemodynamic throughout. This report highlights the airway, positioning and haemodynamic considerations in the anaesthetic management of giant posterior neurofibromas and describes a simple, improvised solution for intraoperative head stabilisation.**

***Keywords:*** *Neurofibroma; Neurofibromatosis Type 1; Giant Neurofibroma; Anaesthetic Management; Airway Management; Prone Positioning*.

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## I. INTRODUCTION

Neurofibromas are benign peripheral nerve sheath tumours arising from Schwann cells, fibroblasts and perineural cells, and are frequently associated with neurofibromatosis type 1 (NF1), an autosomal dominant disorder. While cutaneous and subcutaneous neurofibromas are common, giant variants — arbitrarily defined as those exceeding several kilograms or exceeding 20% of the total body weight or causing gross disfigurement — are uncommon and pose distinctive challenges to the anaesthesiologist [1].

A large posteriorly located mass complicates several aspects of anaesthetic care: supine and lateral positioning for airway management is hampered by the bulk of the tumour, maintenance of a neutral head position may be difficult owing to mass effect, the highly vascular nature of these tumours predisposes to significant intraoperative blood loss, and patients with NF1 may have associated airway, cardiovascular, respiratory and neurological abnormalities [1]. We describe the successful anaesthetic management of a giant neurofibroma of the back extending from C6 to L3, with emphasis on the difficulties encountered during positioning, airway management and blood loss, and the improvised technique used to maintain head stability.

## II. CASE REPORT

A 51-year-old male patient (weight 52 kg, height 160 cm) presented with a large, progressively enlarging swelling over the back since childhood. On examination, there was a giant pendulous mass over the posterior trunk in the subcutaneous plane extending from the C6 to the L3 vertebral level (measuring 45 cm × 36 cm × 7 cm) (Fig. 1). Multiple cutaneous neurofibromas were scattered in other regions as well, including the upper limbs, which made peripheral intravenous access difficult. There was no neurological deficit in the limbs, and bowel and bladder function were normal. Written informed consent was obtained from the patient for the procedure and for publication of this report along with accompanying images.

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Preoperative airway assessment revealed Modified Mallampati grade 2, adequate mouth opening and normal neck movements. Hyomental, thyromental and sternomental distances were within normal limits. Systemic examination of the cardiovascular and respiratory systems was unremarkable. Routine investigations, including complete blood count, renal and liver function tests, and coagulation profile, were within normal limits, with a preoperative haemoglobin of 12 g/dL. Chest radiography and electrocardiography were normal. The patient was a known smoker, without any other comorbidities. The patient was classified as ASA physical status II and was scheduled for excision of the mass. Adequate blood and blood products were arranged and cross-matched preoperatively.

In the operating room, standard monitors (electrocardiography, non-invasive blood pressure, pulse oximetry and capnography) were attached, and baseline parameters were recorded. Two wide-bore intravenous cannulae were secured. Difficulty was anticipated in positioning the patient for airway management because of the bulk of the posterior mass, which prevented the patient from lying flat in the standard supine position and interfered with optimal head and neck alignment for laryngoscopy. The patient was positioned with padding under the shoulders and back so as to counter the tilt produced by the mass and achieve the best possible laryngoscopic view.

After preoxygenation, general anaesthesia was induced with intravenous fentanyl 100 µg and propofol 100 mg, and endotracheal intubation was facilitated with rocuronium 30 mg. Direct laryngoscopy revealed a Cormack–Lehane grade 2A view, and the trachea was intubated with an 8.0 mm cuffed reinforced endotracheal tube. Anaesthesia was maintained with oxygen–air (50:50) and sevoflurane at a MAC of 0.8–1.0, with intermittent neuromuscular blockade. An invasive arterial line was secured in the left radial artery after induction of anaesthesia.

The patient was placed prone after intubation, following which further difficulty was encountered: owing to the mass effect of the tumour, the head tended to deviate to one side, and it was difficult to maintain it in a stable, neutral position (Fig. 2). This created concern regarding inadvertent endotracheal tube displacement and pressure effects during the prolonged procedure. The problem was overcome by centralising the mass momentarily and stabilising the head in the neutral position using adhesive strapping (Dynaplast), which effectively secured the head and prevented lateral deviation for the duration of surgery (Fig. 3). All pressure points were adequately padded and the eyes were protected, and the endotracheal tube position was reconfirmed after positioning.

Intraoperatively, excision of the highly vascular mass was associated with significant blood loss of approximately 2500 mL. Haemodynamic stability was maintained throughout with careful fluid and blood management, comprising 3000 mL of crystalloid and transfusion of 3 units of packed red blood cells and 3 units of fresh frozen plasma, guided by ongoing blood loss, haemodynamic parameters and urine output. The excised mass weighed 9 kg (Fig. 4). Heart rate, blood pressure and oxygen saturation remained stable, and urine output was adequate during the procedure.

At the end of surgery, the patient was made supine, neuromuscular blockade was reversed, and the trachea was extubated after the patient met standard extubation criteria. The postoperative period was uneventful; the patient was monitored in the post-anaesthesia care unit for 2 hours, remained haemodynamically stable, and was shifted to the ward.

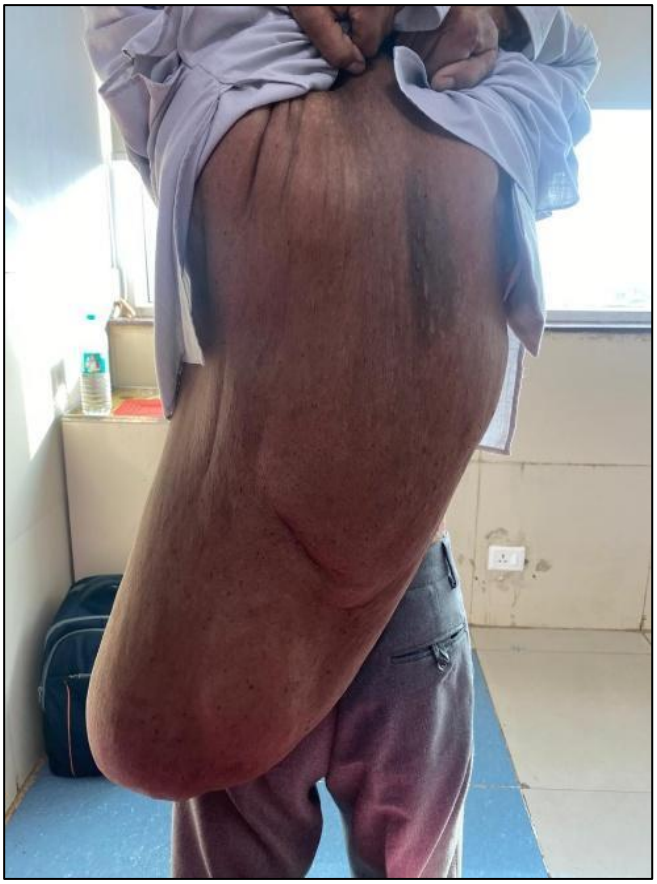

Fig 1 Preoperative Image.

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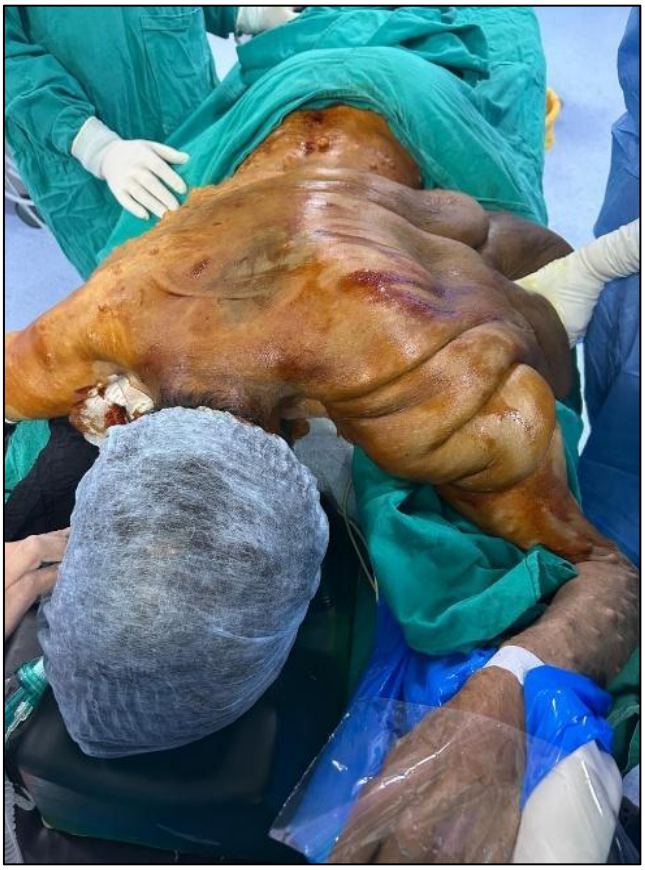

Fig 2 Patient After Prone Positioning Without Head Support, Showing Lateral Tilt.

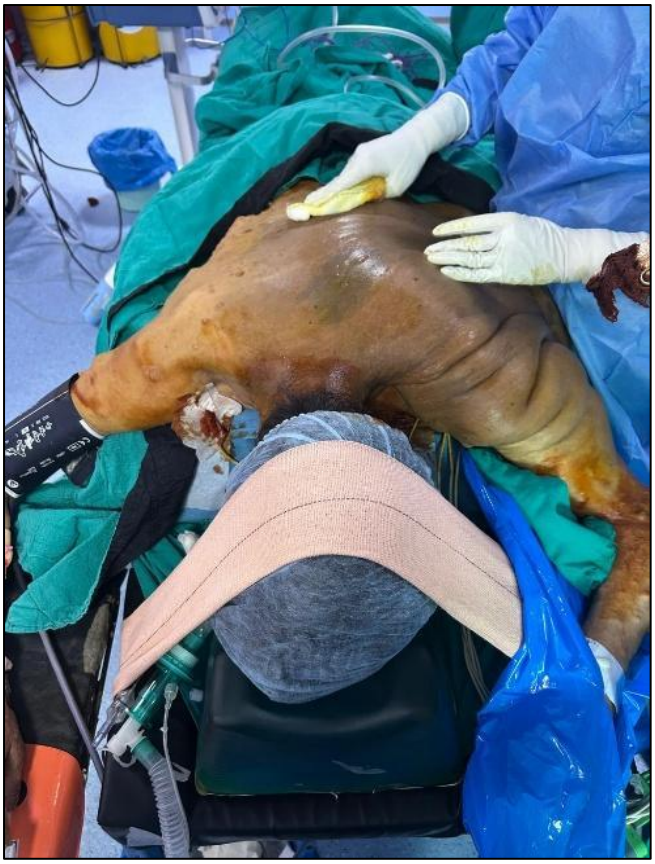

Fig 3 Patient After Prone Positioning With Head Strapped, Minimising Lateral Tilt.

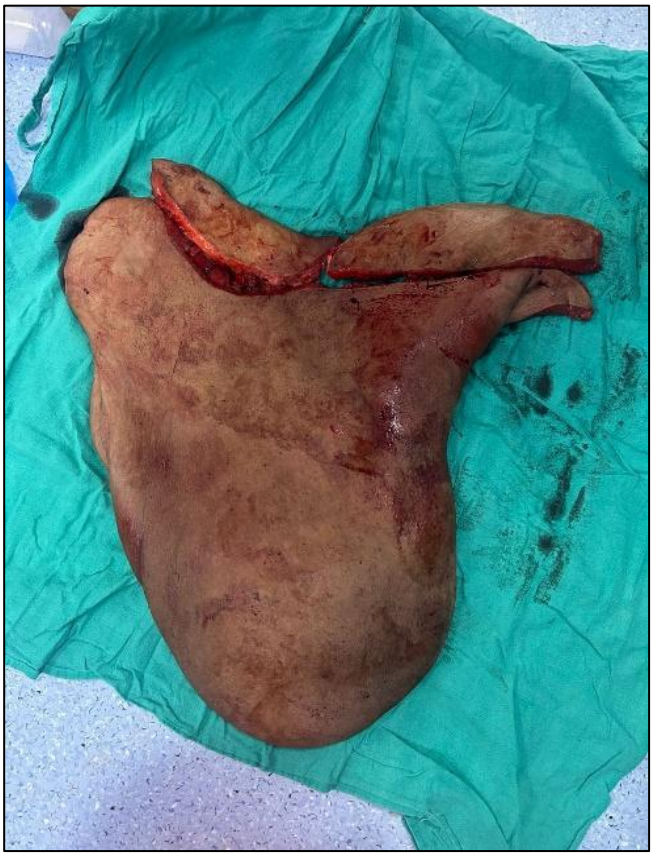

Fig 4 Resected Specimen.

## III. DISCUSSION

Giant neurofibromas are rare, and their anaesthetic management is complicated by their size, vascularity and the systemic associations of NF1 [1]. This case illustrates three principal challenges: positioning for airway management, maintenance of a neutral head position, and significant intraoperative haemorrhage.

Positioning is often the first and most underestimated difficulty. A large posterior mass prevents the patient from lying supine in the conventional manner and distorts the normal alignment of the oral, pharyngeal and laryngeal axes required for direct laryngoscopy. Difficulty with positioning owing to a large posterior or occipital-cervical mass has been described previously: Mendonça et al. reported a similar difficulty in positioning a 15-year-old girl with an occipital-cervical plexiform neurofibroma, in whom cervical instability and a predicted difficult airway led to the use of an awake fibreoptic intubation technique [2]. Strategies to address this include the use of ramping, shoulder and head supports, a lateral or semi-lateral approach, and readiness for awake or video-laryngoscope-assisted intubation when difficulty is anticipated. In this case, careful padding of the back to avoid tilting and appropriate patient positioning allowed conventional laryngoscopy and intubation to be performed safely.

The difficulty in maintaining the head in a neutral position following prone positioning is a less frequently described problem. Although a reinforced endotracheal tube was used

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for prone positioning, the mass effect of the large posterior tumour tended to tilt the head away from the midline, increasing the risk of endotracheal tube migration, kinking or accidental extubation, as well as positioning-related pressure injury, especially during a long procedure performed in the prone position. This problem was managed with a simple and readily available solution — adhesive strapping (Dynaplast) — to secure the head in a neutral position. This improvised technique was inexpensive, effective and easily reversible, and may be useful to others facing a similar problem.

Neurofibromas are vascular tumours, and giant variants can bleed substantially during excision; blood loss may be rapid and difficult to predict. Nahabedian et al., in their original description of giant plexiform neurofibroma of the back, emphasised thorough preoperative imaging with magnetic resonance imaging, computed tomography and arteriography to define the extent of the mass and anticipate intraoperative blood loss [3]. Vélez et al. reported a giant plexiform neurofibroma of the lower back and buttock in which preoperative embolisation combined with an intraoperative linear cutting stapler helped to limit blood loss and transfusion requirement [4], illustrating that adjunctive vascular control techniques can be considered for similarly large and vascular posterior lesions when available. Meticulous preoperative preparation — including securing large-bore intravenous access, arranging cross-matched blood, and planning for invasive monitoring in larger lesions — is essential. More recently, massive intraoperative blood loss requiring transfusion has again been highlighted as a central concern during debulking of large plexiform neurofibromas. In this patient, approximately 2500 mL of blood loss occurred, which was well anticipated and was managed with crystalloid and packed red blood cells while maintaining haemodynamic stability and adequate urine output. Goal-directed fluid and transfusion therapy, guided by ongoing losses and physiological endpoints, is the cornerstone of management.

Patients with NF1 may also have airway neurofibromas, kyphoscoliosis with restrictive lung disease, phaeochromocytoma, cardiovascular abnormalities and altered responses to neuromuscular blocking agents, all of which warrant careful preoperative evaluation. A thorough multidisciplinary assessment, anticipation of difficulty, and preparedness for both airway and haemodynamic challenges are key to a successful outcome.

## IV. CONCLUSION

Giant posterior neurofibromas present significant anaesthetic challenges related to positioning, airway management and intraoperative haemorrhage. Anticipation of difficult positioning, a plan for securing the airway, and adequate preparation for major blood loss are essential. A simple measure such as adhesive head strapping can effectively address the difficulty of maintaining a neutral head position caused by the mass effect of the tumour, contributing to a safe perioperative course.

➢ *Conflict of Interest: No conflict of interest.*

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