

Introduction

- Achondroplasia is the most prevalent form of dwarfism and presents distinctive challenges in anesthesia management due to skeletal dysplasia ¹
- Preoperative assessment should include airway examination and cardiovascular assessment, as there is an increased risk of respiratory and cardiovascular complications in achondroplasia patients during anesthesia.^{2,3}
- Intraoperative measures involve careful positioning and appropriate equipment selection to address potential complications.¹
- Patients with achondroplasia often exhibit anatomical variations such as shortened neck with limited mobility and distorted vertebral anatomy.

Case Description

- 28-year-old, 4'4", 52.2kg male, history of achondroplasia, asthma, anxiety, post-traumatic stress disorder (PTSD), sagittal plane imbalance, spinal stenosis, and obstructive sleep apnea (OSA).
- Medications: alprazolam, aspirin, brexpiprazole, fluvoxamine, gabapentin, morphine, nortriptyline
- Allergies: amoxicillin, cefaclor and tramadol
- Presenting for revision lumbar posterior spinal fusion (PSF), Refusion/Regrafting Fusion T7-L4 and myocutaneous flap closure due to wound dehiscence and hematoma at the surgical site.
- After arrival to the OR, standard ASA monitors were placed followed by placement of a preinduction arterial line.

Case Description Cont.

- Induction: Preoxygenation, Propofol 150mg and Succinylcholine 80mg. The patient was difficult to mask ventilate by a single clinician and subsequently began to desaturate to the mid-80s.
- He required a two-person bag-mask technique to achieve adequate ventilation, and his oxygen saturation returned to 100%.
- He was successfully intubated with a size 7.0 ETT using a McGrath video laryngoscope on the first attempt.
- The rest of the case was completed uneventfully, and he was extubated and transferred to the recovery room.

Figure 2. X-ray Demonstrating Short Pedicles Contributing to Lumbar Spinal Stenosis



Figure 1. Features of Achondroplasia

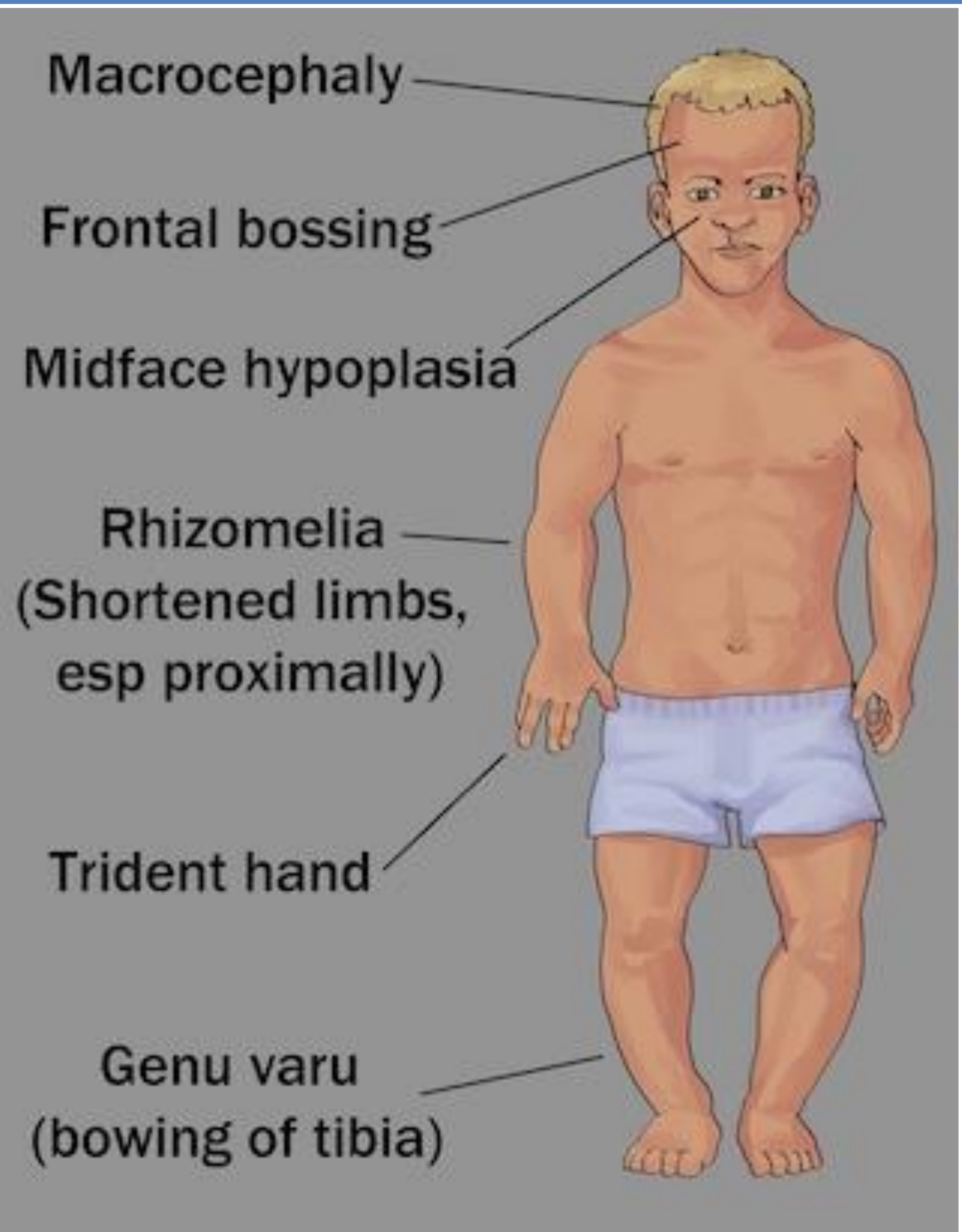
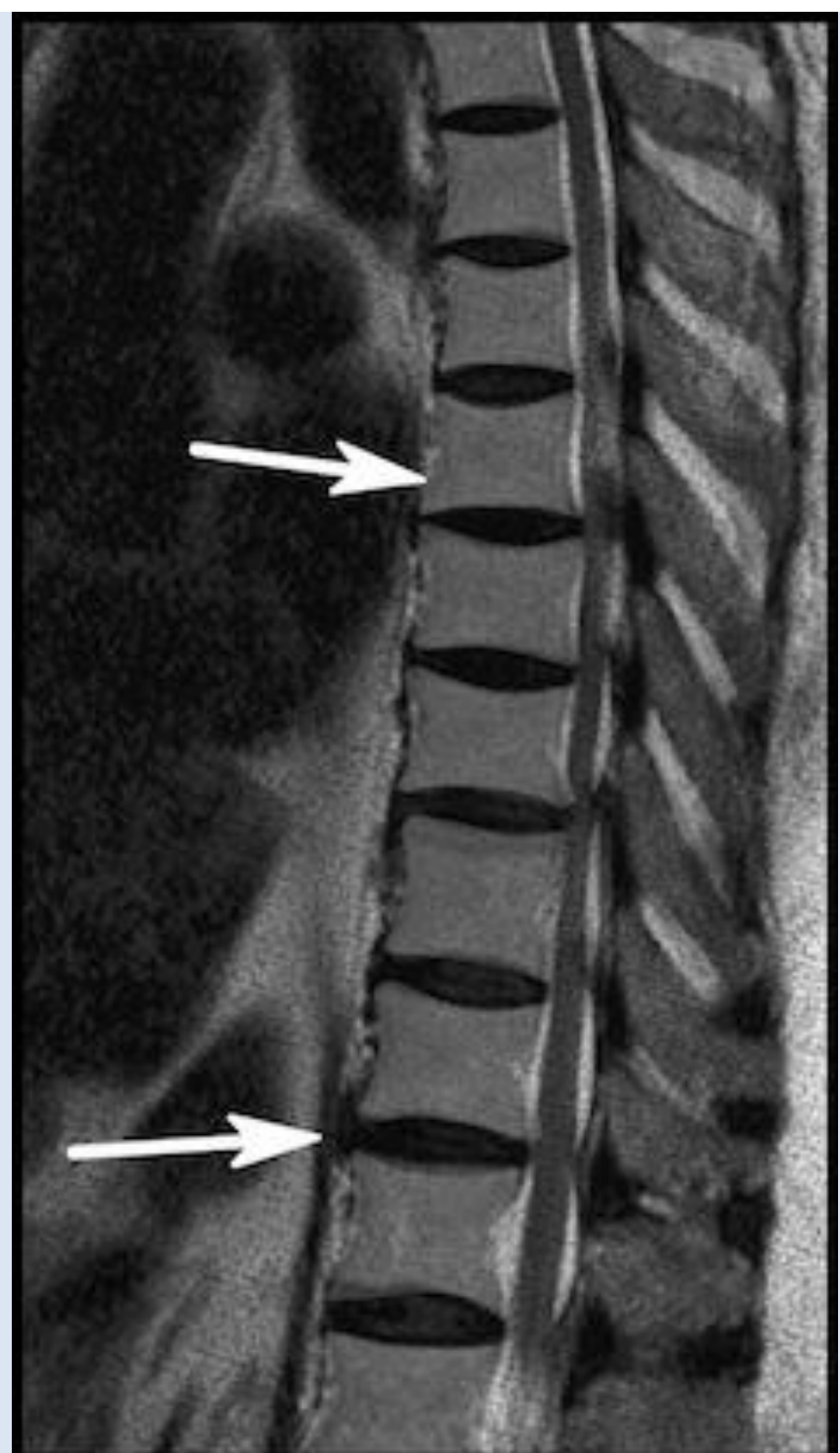


Figure 3. Sagittal MRI Demonstrating Stenotic Thoracic Spinal Canal With Spinal Cord Compression



Conclusion

- This case serves as a reminder that patients with achondroplasia typically present with anatomical anomalies which may predispose them to a difficult airway increasing the risk of respiratory complications, particularly during intubation.
- Anesthetic challenges in this population may also include difficult neuraxial access. ⁴
- Careful consideration of anatomical and physiological differences is crucial for optimizing perioperative outcomes.
- During anesthesia, maintaining appropriate intravascular volume through fluid administration helps prevent hypovolemia, which can exacerbate the risk of spinal cord compression.
- With a meticulous approach to preoperative assessment, tailored intraoperative care based on patient co-morbidities and anatomical variation, complications can be minimized, ensuring safe and effective perioperative care for this patient population.

References

- Desai NK, Choudhry DK. Anesthetic management of patients with skeletal dysplasia. Middle East Journal of Anaesthesiology. 2007;19(5):1049-1060.
- Haga N. Anesthesia for patients with achondroplasia: perioperative management and complications. Journal of Anesthesia. 2016;30(5):907-912.
- Hoover-Fong J, Scott CI Jr., Jones MC. Health Supervision for People with Achondroplasia. Pediatrics. 2021;147(2):e2020022419.
- Kim JH, Woodruff BC, Girshin M. Anesthetic Considerations in Patients With Achondroplasia. Cureus. 2021 Jun 22;13(6):e15832. doi: 10.7759/cureus.15832. PMID: 34322329; PMCID: PMC8297512
- Pauli RM. Achondroplasia: a comprehensive clinical review. Orphanet Journal of Rare Diseases. 2019;14(1):1-25.

Radiographs adapted from Khalid K, Saifuddin A. Pictorial review: imaging of the spinal manifestations of achondroplasia. Br J Radiol. 2021 Jul 1;94(1123):20210223. doi: 10.1259/bjr.20210223. Epub 2021 Apr 29. PMID: 33914619; PMCID: PMC8248197.