

ANESTHETIC CONSIDERATIONS IN A PATIENT WITH PARRY-ROMBERG SYNDROME UNDERGOING FACIAL RECONSTRUCTION WITH AUTOLOGOUS FAT GRAFTING: A CASE REPORT.

Abstract

Parry-Romberg syndrome is a rare disorder characterized by progressive hemifacial atrophy. Altered facial contours may impair mask seal, while associated maxillomandibular abnormalities and neurological manifestations may influence anesthetic planning. We report the case of a 38-year-old man with no known medical history and no previous surgery who underwent facial autologous fat grafting. Preoperative examination showed facial asymmetry, preserved mouth opening, Mallampati class II, a thyromental distance greater than 65 mm, and normal cervical mobility. Craniofacial computed tomography showed no skeletal abnormalities of the right hemiface. Anesthesia was induced with fentanyl 250 µg, propofol 200 mg, and rocuronium 50 mg. Orotracheal intubation with a video laryngoscope and a 7.5-mm reinforced tube was easy (Cormack-Lehane grade II), and anesthesia was maintained with sevoflurane at 2%. Adipose tissue was harvested from the lateral aspect of the right thigh. The intraoperative course was uneventful, with estimated blood loss of 100 mL. Extubation was uncomplicated, and the postoperative course was uneventful. This case highlights the importance of functional airway assessment despite the absence of skeletal abnormalities on imaging and supports individualized planning for ventilation, intubation, and extubation. A single uneventful case cannot establish the superiority of a specific anesthetic technique.

Keywords: Parry-Romberg syndrome; progressive hemifacial atrophy; general anesthesia; video laryngoscopy; mask ventilation; autologous fat grafting; facial reconstruction.

Introduction

Parry-Romberg syndrome, also known as progressive hemifacial atrophy, is a rare disorder involving variable loss of facial skin, subcutaneous fat, muscle, cartilage, and bone. Disease onset usually occurs during childhood or adolescence, with progression over several years before stabilization. Reconstruction may be considered to address contour defects and functional consequences. Its heterogeneous presentation requires assessment of the structures affected and any associated clinical manifestations [1].

Imaging findings range from soft-tissue atrophy to abnormalities of deeper craniofacial structures. Computed tomography (CT) characterizes facial anatomy, while magnetic resonance imaging (MRI) can assess associated intracranial abnormalities. Imaging supplements functional airway assessment rather than replacing it. We describe facial fat grafting in an adult whose CT showed no skeletal abnormalities of the right hemiface and discuss the implications for anesthetic planning [2].

Case Presentation

Preoperative assessment

A 38-year-old man with no known medical history and no previous surgery underwent reconstructive facial autologous fat grafting for Parry-Romberg syndrome. The procedure aimed to restore the volume of atrophic facial regions and improve facial symmetry.

Examination revealed facial asymmetry with reduced soft-tissue prominence, particularly in the malar and cheek region (Figure 1). Mouth opening was preserved. The patient had Mallampati class II, a thyromental distance greater than 65 mm, and normal cervical mobility. No dental or temporomandibular mobility abnormalities were reported. Although conventional findings were relatively reassuring for laryngoscopy, altered facial contours raised concern about achieving an adequate mask seal.



Figure 1. Preoperative photograph of a patient with Parry-Romberg syndrome showing facial asymmetry and reduced soft-tissue prominence, particularly in the malar and cheek region. A black bar covers the eyes to reduce identifiability.

Craniofacial imaging

Preoperative craniofacial CT showed no skeletal abnormalities of the right hemiface. This finding was considered alongside the clinically apparent soft-tissue asymmetry when planning reconstruction and assessing the airway.

Anesthesia and surgery

General anesthesia was selected for this facial procedure. Potential loss of mask seal due to facial atrophy was a principal concern despite relatively reassuring conventional airway findings.

General anesthesia was induced with fentanyl 250 µg, propofol 200 mg, and rocuronium 50 mg.

Orotracheal intubation was performed using a video laryngoscope and a reinforced endotracheal tube with an internal diameter of 7.5 mm. The laryngoscopic view was Cormack-Lehane grade II, and intubation was easy.

Anesthesia was maintained with sevoflurane at a concentration of 2%.

Adipose tissue was harvested from the lateral aspect of the right thigh and used for volume correction of the atrophic facial regions. The intraoperative course was uneventful, with estimated blood loss of 100 mL.

Postoperative course

The patient was extubated without difficulty at the end of surgery. The postoperative course was uncomplicated, with no reported postoperative adverse event.

Discussion

Definition and pathophysiology

Parry-Romberg syndrome exhibits variable tissue involvement and may be accompanied by neurological or ophthalmological manifestations. Immunological, inflammatory, neurogenic, and vascular mechanisms have been proposed, but its pathogenesis remains uncertain. Clinical overlap with linear scleroderma en coup de sabre adds to this variability. For anesthetic planning, the diagnosis should prompt assessment of the individual anatomical and functional phenotype. Our patient's lack of reported skeletal abnormalities illustrates why clinically altered soft-tissue contours require attention independently of bone involvement [3].

Epidemiology and associated manifestations

In a retrospective cohort of 54 patients, Tollefson and Witman identified 13 with isolated Parry-Romberg syndrome, 15 with both Parry-Romberg syndrome and en coup de sabre, and 26 with isolated en coup de sabre. Bilateral involvement occurred in 7.4%, and seizures in 13%. These figures refer to a mixed referral cohort and cannot establish complication rates for all patients with Parry-Romberg syndrome. They nevertheless support attention to associated manifestations during preoperative assessment [4].

Airway considerations

Reduced facial prominence may compromise mask apposition without necessarily making glottic exposure difficult. Jayaram and colleagues described three patients with difficult mask ventilation and individualized methods to improve sealing, including gauze and a molded interface. These observations support evaluating mask fit and preparing alternative ventilation methods. For our patient, Mallampati class II and a CT without skeletal abnormalities did not exclude a mask-seal problem. Any additional interface should be stable, external to the mouth, and compatible with safe ventilation [5].

Preoperative neurological assessment

A history of seizures, atypical headaches, facial neuralgia, visual symptoms, or focal deficits warrants targeted examination and consideration of specialist assessment. Among 80 patients selected for brain MRI, De la Garza-Ramos and colleagues found abnormalities in 48 and

epilepsy in 16. Selection for MRI limits generalization to asymptomatic patients. As a clinical implication, normal craniofacial skeletal findings do not exclude brain involvement; further imaging should be considered with the treating team according to symptoms and prior investigations [6].

Individualized intraoperative management

Bahakeem and colleagues reported airway difficulties in a 16-year-old girl with facial asymmetry and restricted mouth opening undergoing dental surgery. This case demonstrates clinical variability rather than superiority of a particular technique. Our patient's conventional airway findings were more favorable. A reinforced tube may accommodate surgical constraints, but does not resolve difficult mask ventilation or intubation. Drug selection should reflect the patient's condition and airway strategy rather than an assumed syndrome-specific anesthetic regimen [7].

Airway safety strategy

The American Society of Anesthesiologists difficult airway guidelines provide a framework for considering mask or supraglottic ventilation, aspiration risk, apnea tolerance, and emergency invasive airway access. Awake intubation should be considered when the risk assessment supports it; isolated facial asymmetry is not an automatic indication. If induction after loss of consciousness is chosen, oxygenation methods and alternatives should be immediately available, repeated attempts limited, and tracheal placement confirmed by continuous capnography. Tube fixation, circuit access, and a planned response to failed extubation remain relevant during facial surgery [8].

Neuromuscular recovery and postoperative surveillance

After administration of a nondepolarizing neuromuscular blocker, quantitative recovery assessment is particularly relevant when rescue mask ventilation might be difficult. The 2023 American Society of Anesthesiologists guidelines recommend quantitative monitoring at the adductor pollicis and confirmation of a train-of-four ratio of at least 0.9 before extubation. Antagonist selection and dosing depend on the blocker and measured block depth. In this facial context, we propose combining recovery assessment with evaluation of consciousness, effective spontaneous ventilation, and airway patency, followed by postoperative oxygenation and obstruction surveillance [9].

Reconstructive follow-up

Kasielska-Trojan and colleagues prospectively evaluated eight patients treated with facial fat grafting. All required two or three procedures; favorable cosmetic outcomes and no major postoperative complications were reported. The small sample limits conclusions about complication frequency. The possibility of repeat procedures supports retaining a detailed anesthesia record. Our patient had a right lateral thigh donor site and an uncomplicated immediate postoperative course. These findings do not establish long-term volumetric stability [10].

Scope and limitations

This single case highlights the distinction between facial contours relevant to mask sealing and conventional predictors of laryngoscopic difficulty. It cannot estimate airway complication

frequency or compare anesthetic techniques. The CARE recommendations emphasize accurate reporting of interventions, chronology, follow-up, and consent. Recording the actual ventilation, intubation, and recovery conditions is therefore useful, particularly when repeat reconstruction may be considered. The uneventful outcome should be interpreted within these limitations [11].

Conclusions

Parry-Romberg syndrome requires assessment of the functional consequences of facial atrophy. Preserved mouth opening, Mallampati class II, and the absence of skeletal abnormalities on CT do not exclude impaired mask seal. Individualized planning for ventilation, intubation, and extubation, together with coordination with the surgical team, remains essential.

In this patient, facial fat grafting with adipose tissue harvested from the right lateral thigh was associated with an uneventful intraoperative course and estimated blood loss of 100 mL. Extubation and the postoperative course were uncomplicated. This favorable result describes the outcome in one patient and does not demonstrate superiority of a particular anesthetic technique.

Declarations

Consent for publication: [Confirm and document written patient consent for publication of the case and photograph before submission.]

Ethical approval: [Provide the institutional determination and any approval or exemption reference, if applicable.]

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References

1. Tolkachjov SN, Patel NG, Tollefson MM. Progressive hemifacial atrophy: a review. *Orphanet J Rare Dis.* 2015;10:39. doi: 10.1186/s13023-015-0250-9.
2. Wong M, Phillips CD, Hagiwara M, Shatzkes DR. Parry Romberg syndrome: 7 cases and literature review. *AJNR Am J Neuroradiol.* 2015;36(7):1355-1361. doi: 10.3174/ajnr.A4297.
3. Sharma PK, Sekar A, Amir AP, Prabhu ALR. Parry-Romberg syndrome: a case report and literature review. *Radiol Case Rep.* 2024;19(6):2230-2238. doi: 10.1016/j.radcr.2024.02.053.
4. Tollefson MM, Witman PM. En coup de sabre morphea and Parry-Romberg syndrome: a retrospective review of 54 patients. *J Am Acad Dermatol.* 2007;56(2):257-263. doi: 10.1016/j.jaad.2006.10.959.
5. Jayaram K, Gurajala I, Ramachandran G. Difficult mask ventilation made easy: three cases of Parry Romberg syndrome. *Indian J Anaesth.* 2016;60(4):280-283. doi: 10.4103/0019-5049.179467.
6. De la Garza-Ramos C, Jain A, Montazeri SA, et al. Brain abnormalities and epilepsy in patients with Parry-Romberg syndrome. *AJNR Am J Neuroradiol.* 2022;43(6):850-856. doi: 10.3174/ajnr.A7517.

7. Bahakeem RF, Alotaibi FA, Atiah AK, Basodan MA, Abutaha MN. Anesthetic management of a patient with Parry-Romberg syndrome: a case report. *Cureus*. 2025;17(7):e89051. doi: 10.7759/cureus.89051.
8. Apfelbaum JL, Hagberg CA, Connis RT, et al. 2022 American Society of Anesthesiologists practice guidelines for management of the difficult airway. *Anesthesiology*. 2022;136(1):31-81. doi: 10.1097/ALN.0000000000004002.
9. Thilen SR, Weigel WA, Todd MM, et al. 2023 American Society of Anesthesiologists practice guidelines for monitoring and antagonism of neuromuscular blockade: a report by the American Society of Anesthesiologists Task Force on Neuromuscular Blockade. *Anesthesiology*. 2023;138(1):13-41. doi: 10.1097/ALN.0000000000004379.
10. Kasielska-Trojan A, Zieliński T, Antoszewski B. Autologous fat transfer for facial recontouring in Parry-Romberg syndrome. *J Cosmet Dermatol*. 2020;19(3):585-589. doi: 10.1111/jocd.13072.
11. Riley DS, Barber MS, Kienle GS, et al. CARE guidelines for case reports: explanation and elaboration document. *J Clin Epidemiol*. 2017;89:218-235. doi: 10.1016/j.jclinepi.2017.04.026.