Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com/journal/sjmcr/home

OPEN ACCESS

Medial Rectus Muscle Injury after Functional Endoscopic Sinus Surgery

Shinji Makino*

Department of Ophthalmology, Jichi Medical University, Shimotsuke, Tochigi, Japan

***Corresponding author:** Shinji Makino
| **Received:** 12.04.2019 | **Accepted:** 20.04.2019 | **Published:** 30.04.2019
DOI: 10.36347/sjmcr.2019.v07i04.008

Abstract **Case Report**

A 56-year-old man presented with medial rectus muscle injury after endoscopic sinus surgery. His left eye showed marked exotropia and adduction movement was restricted completely. Orbital magnetic resonance imaging revealed a defect in the medial wall of the left orbit and the medial rectus (MR) muscle was not detected clearly. We performed surgery for muscle transposition procedure with resection of the MR muscle under general anesthesia. Postoperatively, exodeviation was improved. Extraocular muscles may be traumatized during endoscopic sinus surgery. Treatment strategies are dependent on accurate interpretation of clinical examination and radiological findings. Surgical strategy may have to be judged during the operation.
Keywords: endoscopic sinus surgery, strabismus, muscle transposition procedure.

INTRODUCTION

The development of transnasal endoscopic sinus surgery (ESS) presents a greater risk for orbital injury. The close proximity of the paranasal sinuses to the orbita places the orbital contents at risk of injury during sinus surgery, especially surgery of the ethmoid sinuses [1-9]. The newer powered devices used for ESS reduce the risk of hemorrhage during sinus surgery but have a greater potential to damage extraocular muscles when accidentally misdirected. Extraocular muscle damage may cause permanent strabismus with troublesome diplopia. Herein, we present a case of medial rectus muscle injury after ESS treated with muscle transposition procedure.

CASE REPORT

A 56-year-old man underwent ESS for chronic sinusitis (Figure 1 a, b), during which left orbital hemorrhage and proptosis of the left eye were observed (Figure 1 c, d).

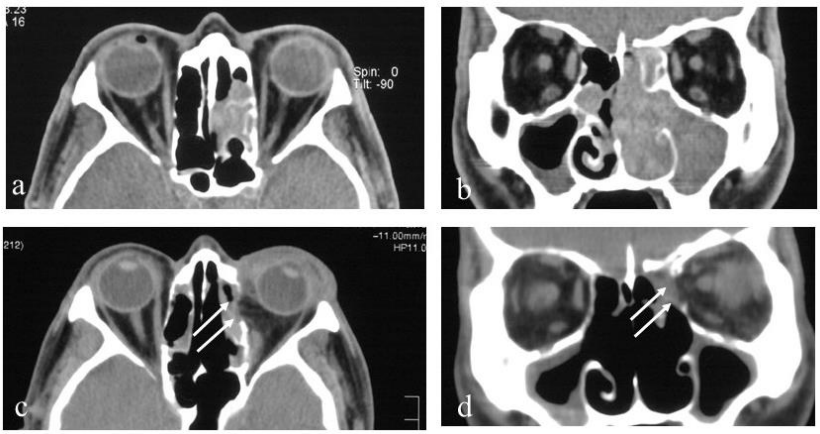

Fig-1: Preoperative (a, b) and postoperative (c, d) CT
Note bone defect on the left medial orbit wall (arrows)

The patient was referred with persistent diplopia 5 days after surgery. He was under treatment with intravenous corticosteroid. On examination, best-corrected visual acuity was 1.2 in both eyes. His left eye showed marked exotropia and adduction movement was restricted completely (Figure 2).

Fig-2: Preoperative ocular motility photographs of the patient in 9 gaze positions

Magnetic resonance imaging (MRI) revealed a defect in the medial wall of the left orbit and the medial rectus (MR) muscle was not detected clearly (Figure 3a, b). We speculated that there was no apparent connection between the proximal and distal segments of the MR muscle.

Fig-3: MRI showed the medial rectus muscle was not detected clearly (hatched yellow circle)

In accordance with the procedure described by Hummelsheim, we performed surgery for muscle transposition procedure with resection of the MR muscle under general anesthesia (Figure 4 a-i).

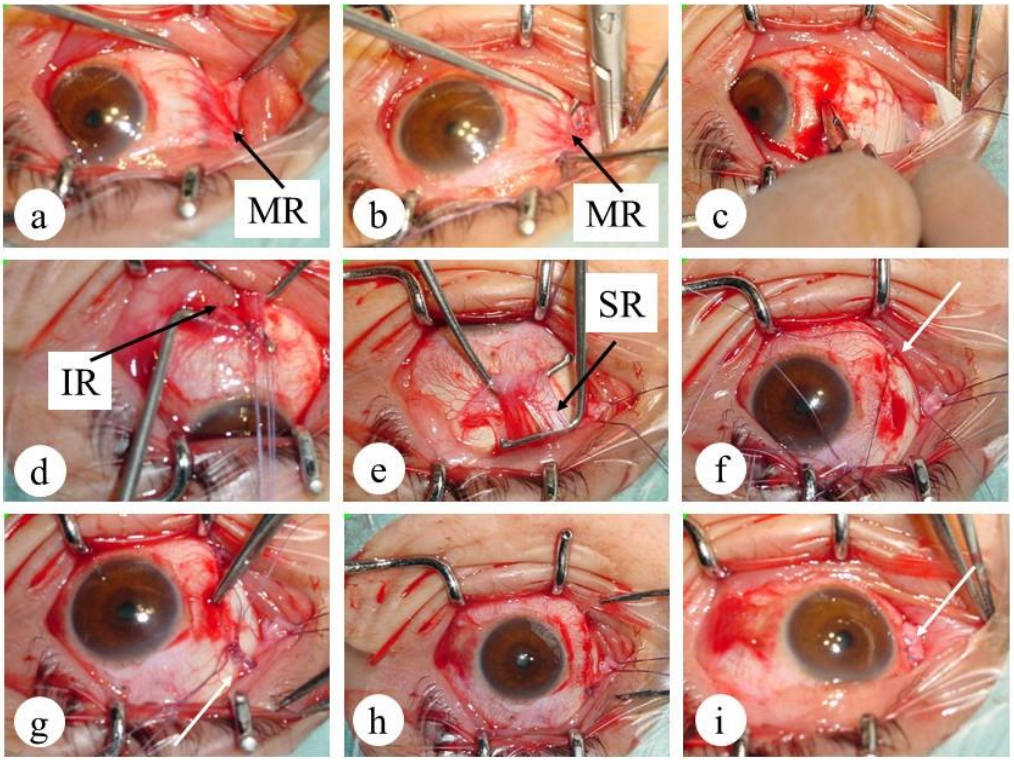

Fig-4: Operative finding of surgical procedure
MR, medial rectus muscle; SR, superior rectus muscle; IR, inferior rectus muscle

During surgery, forced duction test showed no abduction above the midline in the left eye. After a fornix-based conjunctival incision, the MR muscle was explored (Figure 4a, b). The proximal segment of the MR muscle was intact but the distal segment of the MR muscle was not confirmed (Figure 4c). Then, the inferior rectus (IR) muscle was split a half and a double-armed 6-0 suture was placed by passing a needle through the nasal half of the IR muscle (Figure 4d). Next, the superior rectus (SR) muscle was also isolated and the same procedure was performed (Figure 4e). The both sutures were then tied to pull onto the MR muscle insertion point (Figure 4f-h). Finally, MR muscle resection was performed (Figure 4i).

Postoperatively, exodeviation were improved (Figure 5b). The patient was satisfied with the surgical outcome and no postoperative anterior segment ischemia was detected.

Fig-5: Preoperative (a) and postoperative (b) ocular photographs

DISCUSSION

In this present case, we speculated that orbital plate of ethomoid, anterior ethomoidal artery, posterior ethomoidal artery, and Tenon capsule and medial rectus muscle was damaged during ESS.

Recently, ESS has become the primary surgical procedure for obstructive sinus disorders. Although a relatively safe procedure, ESS may cause either minor or major complications [1-9]. The most common ophthalmic complication is orbital

hemorrhage, while other reported orbital complications include optic nerve injury, strabismus and nasolacrimal drainage system injuries. Ocular motility dysfunction may be seen after ESS due to several mechanisms. Direct injury to the extraocular muscle is the most common cause of ocular motility complications after ESS. The medial rectus is the most common extraocular muscle injured because of its anatomical location. To define the location, type and severity of extraocular muscle injury, orbital CT and MRI are needed.

The management of patients with extraocular muscle injury due to ESS is challenging. In particular, surgery strategies depend on type and severity of injury [1-9]. If the muscle has been transected but has a long innervated posterior segment, prompt surgical intervention may allow recovery of this segment. If the muscle has been transected and a large segment is missing or destroyed, prompt muscle transposition surgery is recommended. Surgical techniques, such as resection, recession, reposition of the MR muscle, or muscle transposition from the SR or IR muscles, were used as alternatives when primary reanastomosis was not possible.

CONCLUSIONS

Extraocular muscles may be traumatized during ESS. Treatment strategies are dependent on accurate interpretation of clinical examination and radiological findings. Surgical strategy may have to be judged during the operation.

Disclosure

The author declares no conflict of interest.

REFERENCES

1. Demirayak B, Altıntaş Ö, Ağır H, Alagöz Ş. Medial rectus muscle injuries after functional endoscopic sinus surgery. Turkish journal of ophthalmology. 2015 Aug;45(4):175.
2. Wu H, Shen T, Chen J, Yan J. Long-term therapeutic outcome of ophthalmic complications following endoscopic sinus surgery. Medicine. 2016 Sep;95(38).
3. Cho YA, Rah SH, Kim MM, Lee JY. Vertical rectus muscles transposition in large exotropia with medial rectus muscle transection following endoscopic sinus surgery. Korean Journal of Ophthalmology. 2008 Jun 1;22(2):104-10.
4. Park KA, Oh SY. Extraocular muscle injury during endoscopic sinus surgery: an ophthalmologic perspective. Eye. 2016 May;30(5):680.
5. Aoki K, Sakaue T, Maruo T. Surgery for strabismus secondary to ethmoid sinus surgery. Nippon Ganka Gakkai Zasshi. 2003 Aug;107(8):425-32.
6. Sohn JH, Hong SD, Kim JH, Dhong HJ, Chung SK, Kim HY, Oh SY. Extraocular muscle injury during endoscopic sinus surgery: a series of 10 cases at a single center. Rhinology. 2014 Sep;52(3):238-45.
7. Mukherjee B, Priyadarshini O, Ramasubramanian S, Agarkar S. Iatrogenic Injury to Medial Rectus After Endoscopic Sinus Surgery. Indian Journal of Otolaryngology and Head & Neck Surgery. 2015 Dec 1;67(4):394-402.
8. Thacker NM, Velez FG, Demer JL, Rosenbaum AL. Strabismic complications following endoscopic sinus surgery: diagnosis and surgical management. Journal of American Association for Pediatric Ophthalmology and Strabismus. 2004 Oct 1;8(5):488-94.
9. Artsi EB, Wygnanski-Jaffe T, Shalev B, Spierer A, Yassur I, Zloto O, Prat D, Priel A, Simon GB. Challenging Management of Double Vision After Functional Endoscopic Sinus Surgery—A Series of 6 Cases. American journal of ophthalmology. 2018 Jun 1;190:134-41.