Cocaine-Induced Midline Destructive Lesion Presenting with Medial Rectus Necrosis

Nicholas A. Rossi, MD[1]; Nishat A. Momin, MD[1]; Natalie C. Chamness, BBA[2];
Orly M. Coblens, MD[1]; Harold S. Pine, MD, FACS, FAAP[1]; Sepehr Shabani, MD[1]

[1]Department of Otolaryngology, University of Texas Medical Branch, Galveston, Texas
[2]School of Medicine, University of Texas Medical Branch, Galveston, Texas

Abstract

INTRODUCTION: Cocaine-induced midline destructive lesions (CIMDL) are increasingly recognized sequalae of intranasal cocaine abuse, yet diagnosis remains complicated, and reconstructive options are limited. In this study, we describe an unusual case of CIMDL that presented with medial rectus palsy and palatal fistula mimicking invasive fungal sinusitis, and we review the literature surrounding this rare entity.

METHODS: The patient is a 34-year-old male with a 16-year history of daily cocaine abuse who presented for evaluation of two weeks of diplopia and palatal fistula in the setting of chronic facial pain. Physical examination revealed right medial rectus palsy and a subcentimeter palatal fistula. MRI Brain illustrated a 24 x 18 x 15 mm heterogeneously enhancing mass of the right superior nasal cavity with associated destruction of the lamina papyracea and medial rectus. Nasal endoscopy showed global black crusting of nasal mucosa as well as destruction of almost all native nasal architecture. The right middle turbinate appeared necrotic and black in color. A bedside biopsy was taken of the palatal fistula and right middle turbinate remnant.

RESULTS: Frozen section pathologic analysis of the right middle turbinate remnant showed inflammatory debris without angioinvasion or fungal elements. Given the acuity of his ophthalmoplegia in the face of new palatal fistula and necrotic appearing nasal mucosa, he was taken to the OR urgently for nasal cavity debridement and biopsy. Intraoperatively, dense scarring was seen in the right periorbita coinciding with possible mass seen on MRI. Conservative biopsy was taken of this tissue and was negative for fungal elements or angioinvasion. ANCA screen was negative. Final diagnosis was CIMDL, and he was discharged uneventfully on postoperative day one.

CONCLUSIONS: Prompt recognition and adequate understanding of CIMDL is crucial for Otolaryngologists, especially in the setting of suspicion for possible invasive fungal sinusitis or vasculitis. The authors emphasize early surgical intervention to rule out invasive processes as well as immediate cessation of the offending substance, cocaine.

Introduction

- Cocaine-Induced Midline Destructive Lesions (CIMDL) are an underrecognized consequence of intranasal cocaine abuse. (1-7, 9)
- Diagnosing CIMDL can be challenging due to varied presentations and similar symptomology with other diseases. (2, 3, 5, 7)
- Reconstructive options for CIMDL are often limited, complicating the treatment course. (1, 2, 8)
- The study presents a unique case of CIMDL in a patient with medial rectus palsy and palatal fistula, initially suspected to be invasive fungal sinusitis.
- Objectives of this study:
  - To describe the unusual case
  - To discuss diagnostic challenges
  - To review the existing literature on CIMDL to improve understanding and management of the condition

Case Report

- **Patient Background**
  - 34-year-old male with a 16-year history of daily cocaine abuse
  - Presented with new-onset diplopia and palatal fistula in the setting of chronic facial pain
- **Examination and Imaging**
  - Physical examination revealed right medial rectus palsy and a subcentimeter palatal fistula
  - Nasal endoscopy showed global black crusting of nasal mucosa and destruction of almost all native nasal architecture (**Figure 1**)
  - MRI revealed a 25 x 23 mm heterogeneously enhancing mass in the right superior nasal cavity invading the orbit, with associated destruction of the lamina papyracea and medial rectus (**Figure 2**)
- **Initial Investigations**
  - Bedside biopsy taken from the palatal fistula and right middle turbinate remnant showed inflammatory debris without angioinvasion or fungal elements
  - ANCA screen was negative
- **Surgical Intervention**
  - Patient was taken to the OR for urgent nasal cavity debridement and biopsy of the right middle meatus and periorbital lesion
  - Intraoperatively, dense scarring was seen in the right periorbita coinciding with lesion seen on MRI
  - Conservative biopsy of periorbital tissue was negative for fungal elements or angioinvasion
  - The scarring was released, and necrotic tissue was debrided
- **Resolution**
  - Postoperatively, patient had resolution of diplopia
  - Final diagnosis was CIMDL
  - Patient was discharged uneventfully on postoperative day one

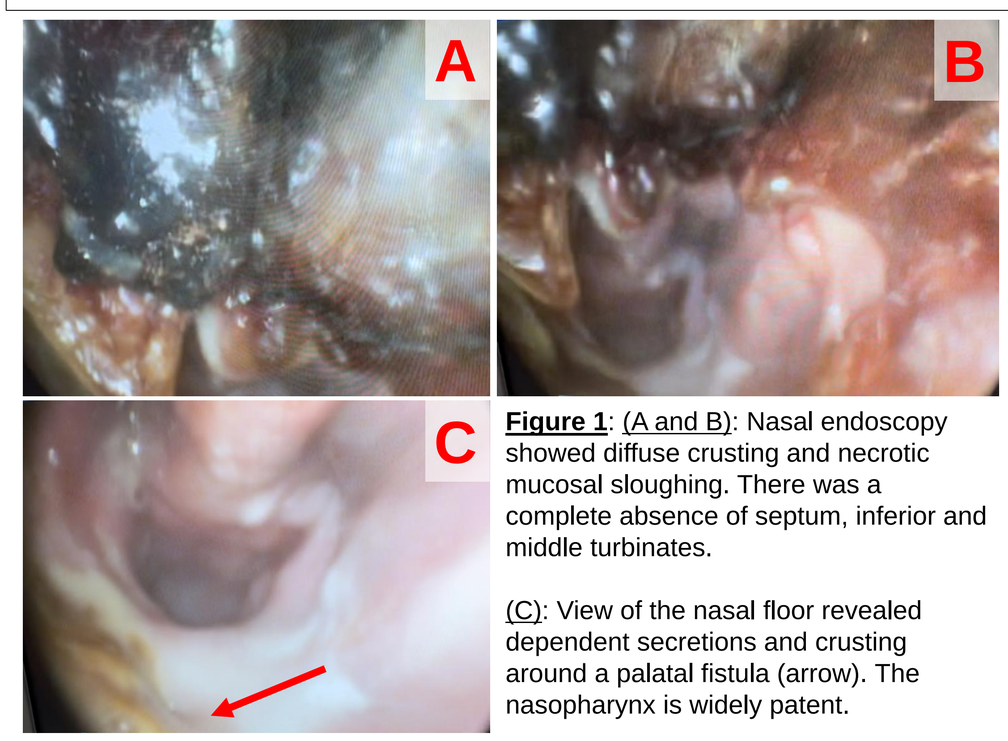

Figure 1: (A and B): Nasal endoscopy showed diffuse crusting and necrotic mucosal sloughing. There was a complete absence of septum, inferior and middle turbinates.

(C): View of the nasal floor revealed dependent secretions and crusting around a palatal fistula (arrow). The nasopharynx is widely patent.

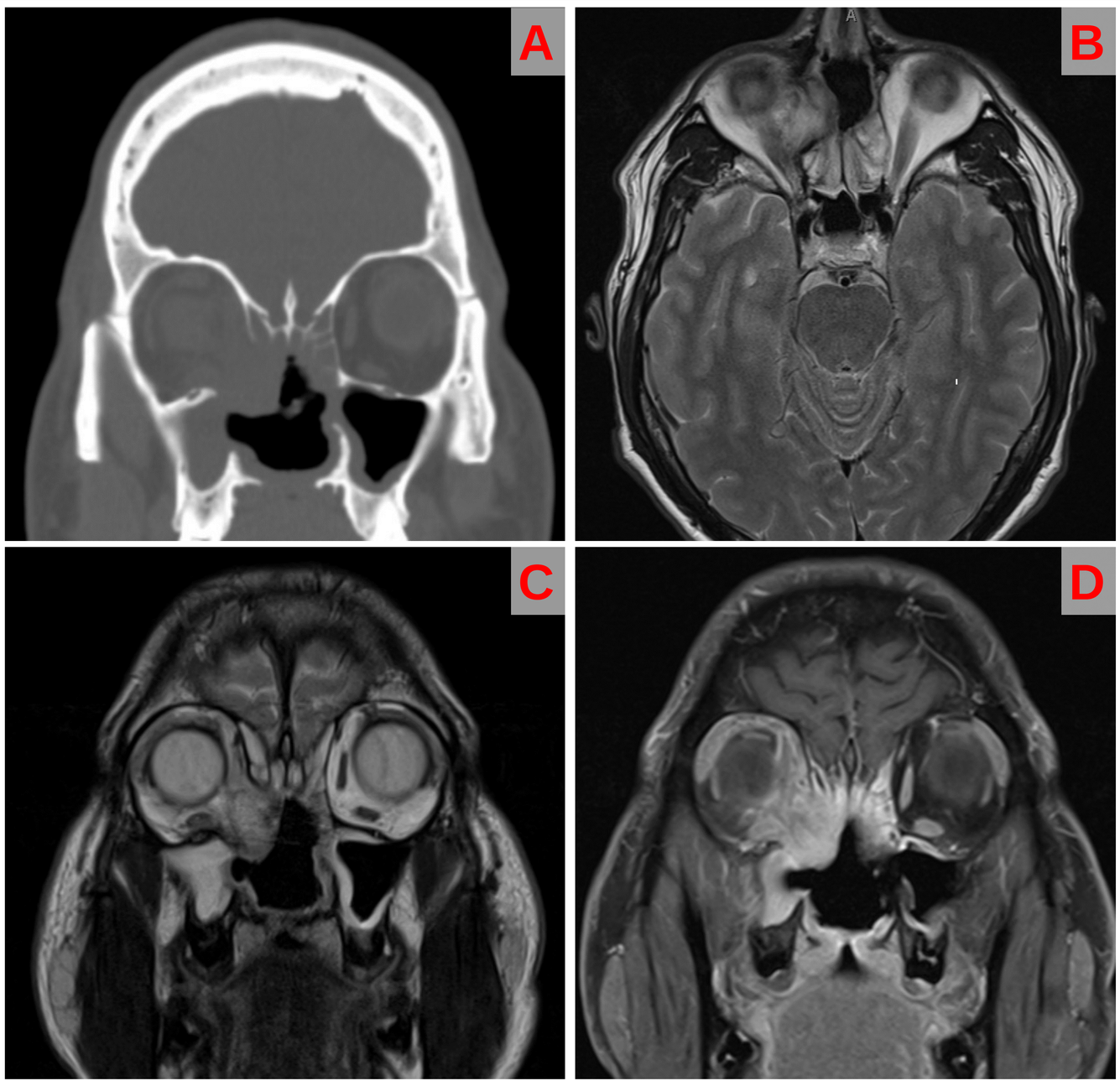

Figure 2: (A): Coronal CT Sinus showing soft tissue thickening and opacification of the right medial orbital wall. Note dehiscence of the right lamina papyracea and absence of nasal septum. (B): Axial contrasted T1 MRI showed a 2.5 x 2.3 cm enhancing soft tissue lesion invading through the medial orbital wall from the nasal cavity. (C and D): Coronal T2 and contrasted T1, respectively, MRI redemonstrates invasion of the soft tissue process into the medial rectus. It abutted the optic sheath without invasion.

Discussion

- Medial rectus palsy as a symptom of CIMDL is notably rare (2, 3, 5, 7, 8), illustrating the diverse potential manifestations of this condition.
- CIMDL can mimic conditions like Granulomatosis with polyangiitis (GPA), lymphoma, tuberculosis, and invasive fungal sinusitis. (2, 3, 7, 9)
  - All these conditions present with similar symptoms of destructive nasal lesions.
- Diagnosis of CIMDL relies heavily on clinical history, physical examination, and biopsy. There is a potential need for further research into more specific diagnostic tools for CIMDL.
- Despite surgical intervention, **cessation of cocaine use** remains the cornerstone of managing CIMDL. (1-10)
- Surgical intervention plays a crucial role in both the diagnosis and management of CIMDL. (1)
  - Our conservative debridement and targeted biopsy approach helped manage the immediate symptoms, particularly the ocular complications.
- A multidisciplinary approach involving mental health and addiction specialists is essential for managing CIMDL. (10)
  - Counseling and support for substance cessation are crucial for successful management.
- Early surgical intervention is advocated to rule out other invasive processes and ensure prompt management. (1, 8)

Conclusion

- CIMDL should be considered in the differential diagnosis of patients with destructive nasal lesions and a history of cocaine use
- Early surgical intervention is key to rule out other invasive processes and obtain a definitive diagnosis
- Immediate cessation of the offending substance remains crucial in the management of CIMDL
- Prompt recognition and understanding of CIMDL is vital, particularly when there is a suspicion of possible invasive fungal sinusitis or vasculitis

Contact: Nicholas A. Rossi, MD
University of Texas Medical Branch
Department of Otolaryngology – School of Medicine
301 University Blvd
Galveston, Texas 77550

References:

1. Colletti G, Autelitano L, Chiapasco M, et al. Comprehensive Surgical Management of Cocaine-Induced Midline Destructive Lesions. Journal of Oral and Maxillofacial Surgery. 2014/07/01/ 2014;72(7):1395.e1-1395.e10.
2. Smith JC, Kacker A, Anand VK. Midline nasal and hard palate destruction in cocaine abusers and cocaine's role in rhinologic practice. Ear Nose Throat J. 2002;81(3):172-177.
3. Gill C, Sturman J, Ozbek L, et al. Cocaine-induced granulomatosis with polyangiitis—an under-recognized condition. Rheumatology Advances in Practice. 2023;7(1):rkad027.
4. Nastro Siniscalchi E, Gabriele G, Cascone P. Palatal fistula resulting from cocaine abuse: a case report. Eur Rev Med Pharmacol Sci. Feb 2012;16(2):280-2.
5. Nitro L, Pipolo C, Fadda GL, et al. Distribution of cocaine-induced midline destructive lesions: systematic review and classification. Eur Arch Otorhinolaryngol. Jul 2022;279(7):3257-3267.
6. Becker GD, Hill S. Midline granuloma due to illicit cocaine use. Arch Otolaryngol Head Neck Surg. 1988;114(1):90-91..
7. Trimarchi M, Bondi S, Della Torre E, Terreni MR, Bussi M. Palate perforation differentiates cocaine-induced midline destructive lesions from granulomatosis with polyangiitis. Acta Otorhinolaryngol Ital. Aug 2017;37(4):281-285.
8. Colletti G, Allevi F, Valassina D, Bertossi D, Biglioli F. Repair of cocaine-related oronasal fistula with forearm radial free flap. J Craniofac Surg. 2013;24(5):1734-1738.
9. Trimarchi M, Gregorini G, Facchetti F, et al. Cocaine-induced midline destructive lesions: clinical, radiographic, histopathologic, and serologic features and their differentiation from Wegener granulomatosis. Medicine (Baltimore). 2001;80(6):391-404.
10. Preuss UW, Bahlmann M, Koller G, Soyka M. [Treatment of cocaine dependence. Intoxication, withdrawal and prevention of relapse]. Fortschr Neurol Psychiatr. 2000;68(5):224-238.