

# A Case of Intraductal Retention of a Fractured Laser Fiber Tip during Parotid Sialoendoscopic Lithotripsy

Raymond Kung, MD<sup>1</sup>; Chad Tracy, MD<sup>2</sup>; Henry Hoffman, MD<sup>1</sup>

<sup>1</sup>Dept of Otolaryngology - University of Iowa Hospitals and Clinics;

<sup>2</sup>Dept of Urology - University of Iowa Hospitals and Clinics

## Abstract

**Objectives:** To identify the occurrence and management of intraductal retention of a fractured laser fiber tip during sialoendoscopic parotid laser lithotripsy.

**Methods:** Retrospective chart review

**Results:** A 66 year old male with a 5mm left parotid sialolith proximal to the hilum underwent sialoendoscopy with a 200 micron single use holmium laser fiber to fragment the stone and facilitate its extraction. Midway into the case, a 4mm piece of the laser fiber tip was found to have fractured within the parotid duct. Ductal dilation was required to permit placement of a 1.6 mm O.D. sialoendoscope with a sufficiently large working channel for the use of micro-forceps to remove the foreign body.

**Conclusions:** Fragmentation of laser fiber tips has been identified as a more common occurrence in urologic procedures but can be readily addressed through retrieval of the fragmented fiber in the larger renal collecting system. However, the relatively narrow salivary duct system may not accommodate larger instrumentation and retrieval would generally be considered more difficult. The report of this complication warrants attention both to help in preoperative patient counseling and in directing consideration for application of non-laser based alternatives for sialolith fragmentation.

## Introduction

With the recent advent of minimally invasive endoscopic management of salivary gland pathology, several studies suggest that sialoendoscopic laser fragmentation of salivary lithiasis is safe and effective. Complications from an exclusively endoscopic approach to laser sialolithotripsy include postop ductal stricture (<2%), laceration (5%), perforation, infection of the papilla (23%), and glandular infection (2.5%)[1]. The most commonly reported sequela is temporary glandular swelling (88%). This study seeks to investigate a rarely reported complication in the evolving field of sialoendoscopy – intraductal fracture of a laser fiber.

## Case Report

A 66 year old male with recurrent parotitis was found to have a 5mm left parotid sialolith proximal to the hilum (Fig.1) and underwent sialoendoscopy. A 200 micron single use Holmium:YAG laser fiber manufactured by Laser Peripherals was implemented through a 1.3mm O.D. Marchal sialoendoscope to fragment the stone and facilitate its extraction. After a protracted period of laser fragmentation, a 4mm long piece of the laser fiber tip was found to have detached within the parotid duct (Figs.2,3). Ductal dilation was required to permit placement of a 1.6 mm O.D. semi-rigid Zenk sialoendoscope with a sufficiently large working channel for the use of micro-forceps to remove the foreign body. A new Ho:YAG laser fiber was employed to further fragment the stone into pieces which were deemed small enough to expect uneventful self-extrusion.



Figure 1. Radiopaque 5mm left parotid sialolith proximal to the hilum measuring 238 Hounsfield units (white arrow)

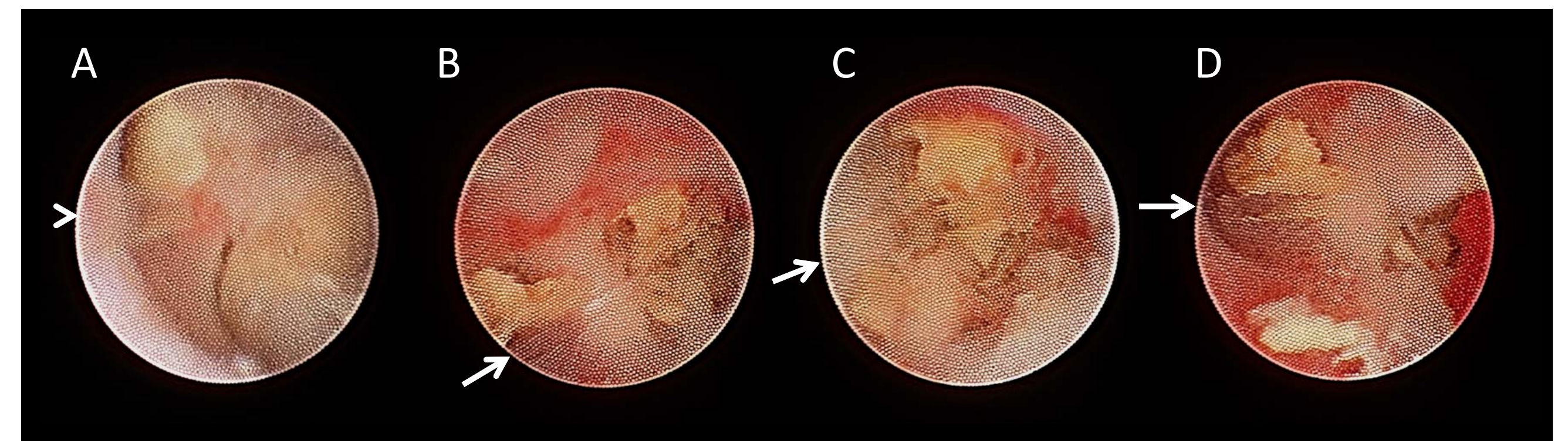


Figure 2. A) Intact laser fiber (white arrowhead) applied through a 1.3mm Marchal sialoendoscope. B-D) Fragment of laser fiber tip (white arrows).



Figure 3. Laser fiber fragment retrieved by micro-forceps employed through the working channel of a 1.6mm O.D. Zenk sialoendoscope.

## Discussion

Instances of endoscopic instrument breakage in salivary procedures are rare. Drage et al. describes a case of fluoroscopically-guided stone retrieval where the basket and calculus became impacted necessitating surgical intervention for their removal[2]. According to Gallo et al., all reported cases of intraductal breakage or blockage of salivary endoscopic tools, except the aforementioned, were amenable to endoscopic removal of the instrument. The authors concluded that this rare complication does not pose a major concern. If, however, a retained foreign body were not removed, this may result in ductal stricture and/or calculus formation as evidenced by two pediatric cases in which formation of sialoliths around intraductal pieces of hair was observed[3].

In a study of the durability of laser fibers, Raif et al. described damage to the front surface of a sapphire rod-tipped Er:YAG laser during lithotripsy with the rod contacting the salivary stone. No fracture of the rod occurred and it was concluded that fiber durability especially if designed for single use is sufficient to assure patient safety[4]. Our case report, however, demonstrated that even single use laser fibers carry the risk of fiber damage.

Reports of fragmentation of laser fiber tips in non-salivary endoscopic procedures have involved Ho:YAG laser fiber fracture within the working channel of flexible ureteroscopes[5]. This mechanism of fiber fracture is likely attributable to the endoscope's ability to curve its tip up to 270 degrees, which is often applied in ureteroscopic lithotripsy but not in rigid or semi-rigid sialoendoscopy. Laser fiber tip fracture has also been reported during flexible bronchoscopy. Mehta et al. reported breakage of a 7mm length of a 2.2x3.5mm flat tip Nd:YAG laser sapphire contact probe during endobronchial lysis of obstructive lesions[6].

## Conclusion

The report of this rare complication along with similar incidents in non-salivary endoscopic procedures utilizing laser fibers warrants attention both to help in preoperative patient counseling and in directing consideration for application of non-laser based alternatives for sialolith fragmentation.

## Contact

Raymond Kung, MD  
University of Iowa Hospitals and Clinics  
Dept. of Otolaryngology  
Email: raymond-kung@uiowa.edu  
Phone: (319) 356-2177

## References

- Gallo A, Benazzo M, Capaccio P, et al. Sialoendoscopy: state of the art, challenges and further perspectives. Round Table, 101(st) SIO National Congress, Catania 2014. *Acta otorinolaryngologica Italica : organo ufficiale della Societa italiana di otorinolaryngologia e chirurgia cervico-facciale*. Oct 2015;35(4):217-233.
- Drage NA, Brown JE, Escudier MP, McGurk M. Interventional Radiology in the Removal of Salivary Calculi. *Radiology*. 2000;214(1):139-142.
- Nahlieli O, Baruchin AM. Long-term experience with endoscopic diagnosis and treatment of salivary gland inflammatory diseases. *The Laryngoscope*. Jun 2000;110(6):988-993.
- Raif J, Vardi M, Nahlieli O, Gannot I. An Er:YAG laser endoscopic fiber delivery system for lithotripsy of salivary stones. *Lasers Surg Med*. Jul 2006;38(6):580-587.
- Knudsen BE, Glickman RD, Stallman KJ, et al. Performance and safety of holmium: YAG laser optical fibers. *Journal of Endourology / Endourological Society*. Nov 2005;19(9):1092-1097.
- Mehta AC, Grimm M. Breakage of Nd-YAG laser sapphire contact probe inside the endobronchial tree. *Chest*. May 1988;93(5):1119.