

Transnasal Endoscope Locked in a Bent Position Causing Difficult Withdrawal

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Abstract

We report a rare but severe complication of routine transnasal esophagogastroduodenoscopy (EGD). The tip of a transnasal endoscope was locked in a bent position. Since the bent tip was unable to be returned to a neutral position, the snare from another endoscope inserted transorally was used to straighten it, which allowed the transnasal endoscope to be withdrawn with only mild injury to the gastric mucosa. Endoscopists should be aware of this complication and how to manage it.

Introduction

Transnasal endoscopy is a widely used technique for routine, unsedated endoscopic examination of the upper gastrointestinal tract because scope insertion is well tolerated.¹ We describe an unusual complication during routine transnasal endoscopy involving an instrument whose tip became locked in a coiled position and was difficult to withdraw.

Case Report

A 37-year-old Japanese man was undergoing transnasal esophagogastroduodenoscopy (EGD) without sedation for evaluation of epigastric discomfort. Endoscopic examination of the upper gastrointestinal tract did not reveal any gastric ulcers or cancer, but a small gastric polyp was detected in the cardia and biopsy was attempted. The tip of a transnasal endoscope (Fujinon EG-530N2; Fujifilm Corporation, Tokyo, Japan) that had been in daily use for 3.5 years with appropriate regular maintenance was bent to reach the cardiac polyp. When the handle was forcefully rotated to achieve a very sharp angle, the bent tip of the instrument became locked in position despite release of the handle. After this maneuver, the handle could be turned freely but this did not change the position of the instrument tip, which could not be returned to a neutral position. We attempted to withdraw the scope slowly, expecting the scope to straighten during the withdrawal process, but the tip remained bent and pressed against the gastric wall, causing pain while the instrument was being retracted.

The patient was transferred to an X-ray room with the scope still inserted. X-ray examination showed that the tip of the scope was coiled (Figure 1A, red arrow). We inserted another endoscope transorally (Olympus GIF-Q260; Olympus Corporation, Tokyo, Japan, Figure 2A). The tip of the transnasal scope was grasped with a snare from the transoral endoscope and pulled forcefully (Figure 2B, green arrow). After several initial unsuccessful attempts, the bent tip of the transnasal scope, through which biopsy forceps were inserted to encourage a straightened configuration, returned to the neutral position (Figures 1B and 2C). The straightened transnasal endoscope was finally withdrawn with only mild injury to the gastric mucosa (Figure 2D). No surgical procedure was required.

ACG Case Rep J 2014;1(2):79–81. doi:10.14309/crj.2014.7. Published online: January 10, 2014.

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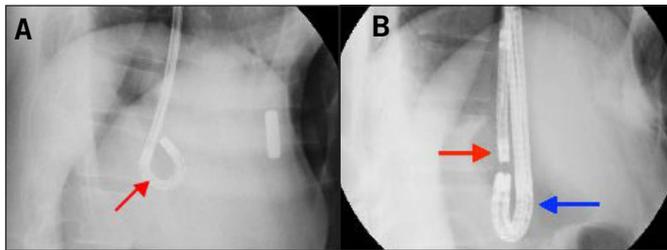


Figure 1. X-ray showing the straightening of the bent transnasal endoscope (red arrow) with the use of a transoral endoscope (blue arrow). (A) The transnasal endoscope was locked in a coiled position. (B) The tip of the transnasal endoscope was successfully uncoiled.

After the transnasal endoscope was removed, it was inspected by the manufacturer to determine the cause of this phenomenon. When the base of the endoscope is opened, there is usually a stopper (Figure 3A, red arrow), located next to the sleeve (Figure 3A, blue arrow) of the wire that controls the direction of bending. This stopper prevents overbending. In the present case, the stopper was broken and the sleeve slid under the broken stopper (Figure 3B, red and blue arrows). Since this part is encased in a metallic frame (Figure 3A and 3C, yellow arrows), abnormal movement of the sleeve probably disabled the handle's ability to control the tip of the instrument.

Discussion

The use of transnasal endoscopy without sedation as a routine endoscopic examination procedure is increasing due to its safety and patient tolerability.² However, this case shows that a rare but severe complication can occur during this procedure. To date, the only major complication reported

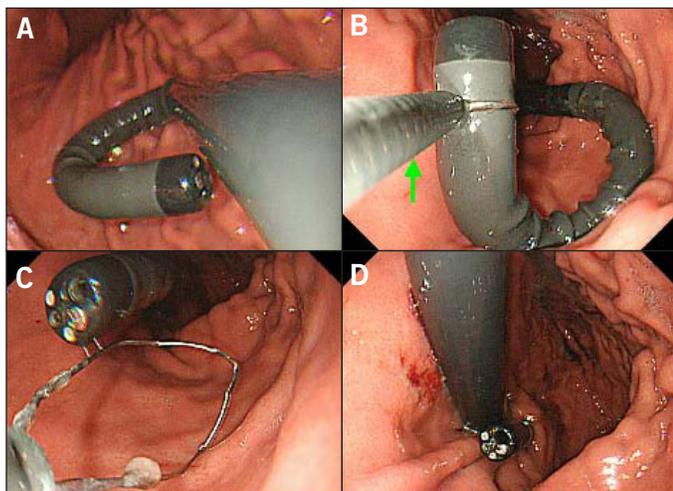


Figure 2. Endoscopic views of the uncoiling of the transnasal endoscope through the transoral endoscope. (A) The transnasal endoscope was locked in a coiled position. (B) The bent tip of the transnasal endoscope was grasped with a snare. (C) The transnasal endoscope was straightened. (D) Withdrawal of the transnasal endoscope.

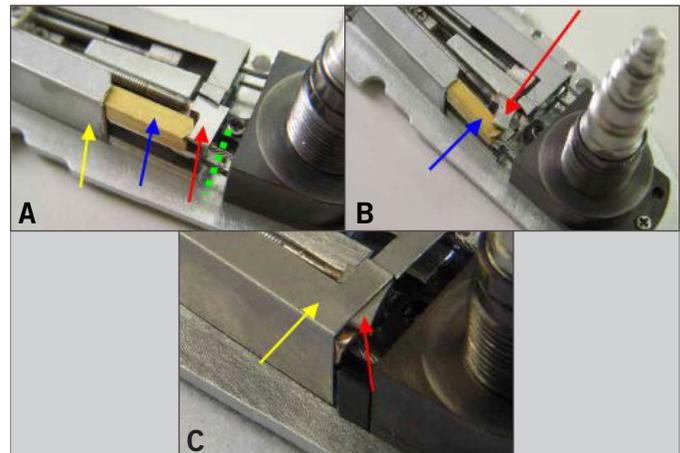


Figure 3. Opened base of the withdrawn transnasal endoscope. (A) Parts of the bending system in the normal position. The stopper (red arrow) is attached just proximal to the sleeve of the wire (blue arrow) to prevent overbending. The metal cover (yellow arrow) was removed to show the parts of the bending system. When the tip of the fiber is locked in a bent position, the wire should be cut at the green dotted line to release the tension in the wire. (B) A broken stopper found in the present case. The sleeve of the wire slid under the stopper. (C) Since the system is covered with a metal frame, the sleeve disturbed the sliding motion of the wire, rendering it impossible to release the bend through the controls in the handle.

was one case of esophageal perforation.³ Tatsumi et al⁴ reported difficult scope withdrawal in 0.12% of approximately 13,000 cases performed in 14 Japanese institutions. Whereas difficult withdrawal was mainly due to a narrow nasal cavity in their study, the inability to withdraw the scope in the present case was due to an unexpected fixed bend in the instrument.

The appropriate way to resolve a fixed bend similar to the one in the present case was discussed with the endoscope manufacturer. The best approach is to cut the wire at the bottom of the endoscope (Figure 3A, green dotted line) after opening the base of the endoscope. This will release the tension in the wire that maintains the bend, thus allowing the tip to straighten during a slow withdrawal. This procedure can be done while the scope was inserted in the patient, because the base of the endoscope is in the endoscopist's hand. However, it requires the base of the endoscope to be opened. The tool to open this part will be provided from the manufacturer. Alternatively, the fiber of the endoscope can be cut easily with scissors, although this would render the scope non-functional for further use. Extreme rotation of the handle should be avoided to prevent this complication.

In conclusion, fixed coiling of the transnasal endoscope is a possible severe complication of transnasal EGD. Endoscopists should be aware of this complication and how to manage it. Improvements in endoscope design to prevent this complication are under development by the manufacturer.

Disclosures

Author contributions: H. Toyoda participated in patient care and technical analysis, and is the article guarantor. Y. Hisanga participated in patient care. T. Kumada supervised the manuscript creation.

Financial disclosure: The authors declare that there are no conflicts of interest associated with this case report.

Informed consent was obtained for this case report.

Acknowledgement: The authors thank the manufacturer, Fujifilm Corporation, for investigating the mechanical cause of this complication.

Received: November 10, 2013; Accepted: January 3, 2014

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