Robot and Laser-assisted Trans-oral Removal of Anterior Cervical Instrumentation

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Introduction:
Since the introduction of the technique in the 1950s, anterior cervical disectomy and fusion (ACDF) has become a widely accepted and effective method of treating cervical spondylotic myelopathy, radiculopathy and traumatic injury. Very few case reports exist documenting delayed extrusion of hardware and erosion through the pharyngoesophageal mucosa. We present an interesting case of a 60-year-old woman who underwent anterior cervical fusion 15 years ago and was subsequently seen after a traumatic fall that resulted in loosening of the C3 screw and violation of the hypopharyngeal mucosa. This case highlights the rarity of delayed complications of anterior cervical fusions and a novel treatment approach.

Methods:
The patient was brought to the operating room, prepped and draped in sterile fashion, and an appropriately sized Crowe-Davis mouth gag was placed. The bulge in the oropharynx readily came into view. The da Vinci robot was docked, a CO2 laser was used to incise a small opening in the mucosa just large enough for the screw head to pass through, and a combination of forces and a needle driver were used to carefully back the screw out with sequential counterclockwise turns. The mucosa was then repaired and the mouth gag was removed.

Results:
The treatment method used in our case involves a robotic, trans-oral screw retrieval with laser assistance. This is significant because there are few cases represented in the literature utilizing an endoscopic, trans-oral or robotic approach for retrieval and repair of delayed esophageal perforations after ACDF. Use of the CO2 laser reflects current trends in minimally invasive spine surgery, which allow increased technical accuracy in small anatomic work spaces with reduced risk of incidental iatrogenic injury and blood loss. This method, moreover, significantly reduces the risks associated with re-operation of the anterior cervical spine. In our patient, the loose screw was removed robotically without any post-operative dysphagia or odynophagia.

Conclusions:
This case represents a rare, delayed complication of anterior cervical fusion at the C2-C3 level. Comparable reports have been published about hardware extrusions and pharyngeal perforations at the C2-C3 level; however, our case represents an atypical presentation and a novel approach to treatment. Lacking the most common presenting symptom of dysphagia, our patient was diagnosed early and treated using a minimally invasive trans-oral, robot-assisted approach. This resulted in the prevention of severe infectious sequelae and successful CO2 fiber optic laser-mediated hardware retrieval without any secondary complications.

References: