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What is This?
Unilateral Degloving Injury and Partial Fracture of the Arytenoid Cartilage

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Keywords
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Unilateral degloving injury of the arytenoid cartilage following laterally directed trauma to the larynx is very rare.¹ Partial fracture of the arytenoid due to external blunt trauma also rarely occurs without fractures of the laryngeal framework. We experienced an unusual case of a unilateral degloving injury with partial fracture of the arytenoid cartilage only, which was repaired by endolaryngeal surgery. The patient has been free from dysphonia over a 4-year follow-up period. To the best of our knowledge, this is the first published case of this type of injury. Permission for publication of this case was obtained by the Yamaguchi University Hospital Institutional Review Board.

Case Report
A 13-year-old boy presented to the outpatient otolaryngology department with hemoptysis, dysphonia, and pain on phonation and odynophagia in the left neck at the level of the thyroid cartilage following an accidental collision involving his neck and his friend’s shoulder. The GRBAS (Grade, Roughness, Breathiness, Asthenia, Strain) score was G3R1B3A0S0, and the patient’s maximum phonation time (MPT) was reduced to 10 seconds. There was no dyspnea or swelling of the neck.

Flexible laryngeal endoscopy revealed vertically oriented mucosal lacerations overlying and exposing the left arytenoid cartilage. Although vocal fold adduction was impaired, abduction was not impaired, and no laryngeal edema was observed. Partial exposure of the arytenoid cartilage in the laryngeal lumen was noted only on adduction during phonation (Figure 1).

There were no accompanying fractures of thyroid cartilage and cricoid cartilage on computed tomography (CT) and no subcutaneous emphysema around the larynx. The patient’s laryngeal injury was classified as group III by the Schaefer-Fuhrman classification system.²

Direct laryngoscopy under general anesthesia was performed the same day. The body of the arytenoid cartilage was fractured and the vocal process was exposed (Figure 2). A subtle subluxation of the cricoarytenoid joint was also observed. The lacerations were well closed with interrupted 5-0 absorbable sutures by endolaryngeal surgery. We did nothing to the body of the arytenoid cartilage. The patient retained normal vocal cord mobility and postoperative glottic closure was complete, except for a slight forward displacement of the apex of the arytenoid. The patient’s GRBAS score was improved to G0, and the MPT was >30 seconds 1 month after surgery. After 4 years of follow-up, the patient remained free from voice disorders.

Discussion
There are several types of arytenoid injury among the multiple types of laryngeal injuries (Suppl. Table S1, available at otojournal.org).¹,³ First is total cricoarytenoid (CA) joint

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disruption, defined as an avulsion. Avulsion occurs in cases of severe laryngeal trauma and is often accompanied by multiple cartilage fractures or mucosal distraction. Second is arytenoid displacement, classified into dislocation, complete separation of joint surfaces and subluxation, and lesser or partial separation of the CA joint. Arytenoid displacement is an important complication of endotracheal intubation. The third is degloving, the removal of the mucosa from the arytenoid cartilage. This type of arytenoid injury is very rare but may be the sole injury after a blunt laryngeal trauma. It tends to occur in pediatric patients because their laryngeal cartilages have not become ossified. In case of lateral blunt trauma, the thyroid ala may bend and push the arytenoid cartilage toward the vertebra, and the vocal process will break through the mucosa and be exposed to the endolaryngeal lumen.

Stanley and Colman1 reported a series of 6 isolated unilateral degloving injuries of the arytenoid cartilage resulting from blunt laryngeal trauma and concluded that arytenoid dislocations represented a poor prognosis with respect to vocal cord mobility and voice quality. In the present case, we were interested to note that the partial fracture of the arytenoid cartilage may have served to lessen the impact of the traumatic force and to change the direction of the force, thus preventing dislocation of the arytenoid cartilage.

Primary closure of endolaryngeal lacerations is one of the principal goals in the treatment of these injuries. The key is coverage of the exposed cartilage, because exposed cartilage leads to poor healing and may cause arytenoid fixation. A laryngofissure approach is often used to repair this type of laryngeal injury4; fortunately in the present case, endolaryngeal suturing of both fractured cartilage and mucosa was performed without difficulty.

**Author Contributions**

Hirotaka Hara, acquisition of data, data analysis, drafting, final approval; Kazuma Sugahara, data analysis, drafting, final approval; Hiroshi Yamashita, conception and design, drafting, final approval.

**Disclosures**

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**Supplemental Material**

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**References**


