

## Hirsute Esophagus: Clinical and Roentgen Features

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**Abstract.** Clinical and roentgen features of hirsute esophagus in 3 patients are described. Exuberant hair growth and masses of hair in the endopharyngo-esophagus produced the classic clinical triad of progressive dysphagia, hair-spitting, and choking spells. This unique and rare complication of reconstructive surgery of the pharynx and esophagus is related to the skin flaps which are mobilized and rotated to reconstruct a skin tube endopharyngo-esophagus and to restore anatomical continuity of the gastrointestinal tract.

**Key words:** Esophagus, hirsute – Esophagus, reconstructive surgery – Endoesophagus – skin tube esophagus.

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Advances in reconstructive head and neck surgery have prompted radical approaches to the treatment of pharyngeal and cervical esophageal carcinoma. Following laryngopharyngo-esophagectomy, reconstruction of the hypopharynx and cervical esophagus is accomplished by raising full-thickness deltopectoral or laterally based cervical skin flaps [1, 2]. These flaps are rotated to reconstruct the endopharyngo-esophagus to provide anastomotic surface to the original esophagus or its visceral esophageal substitute and the pharynx to establish gastrointestinal continuity. The outer epithelial surface of the skin flap becomes the inner surface of the reconstructed tube. The inner lining of the "skin tube esophagus" continues to shed desquamated epithelial cells and is apparently resistant to abrasions and ulcerations. However, this surface may bear hair follicles. The hair follicles

usually atrophy in 6–12 months. In rare instances excessive amounts of hair continue to grow and produce the clinical triad of progressive dysphagia, hair spitting, and choking spells due to large masses of hair. We report 3 patients who presented with the classic clinical triad and showed characteristic radiographic features of hirsute esophagus. This unique and rare complication of postoperative reconstructed "skin tube endoesophagus" has only been reported once before in the radiologic literature [3].

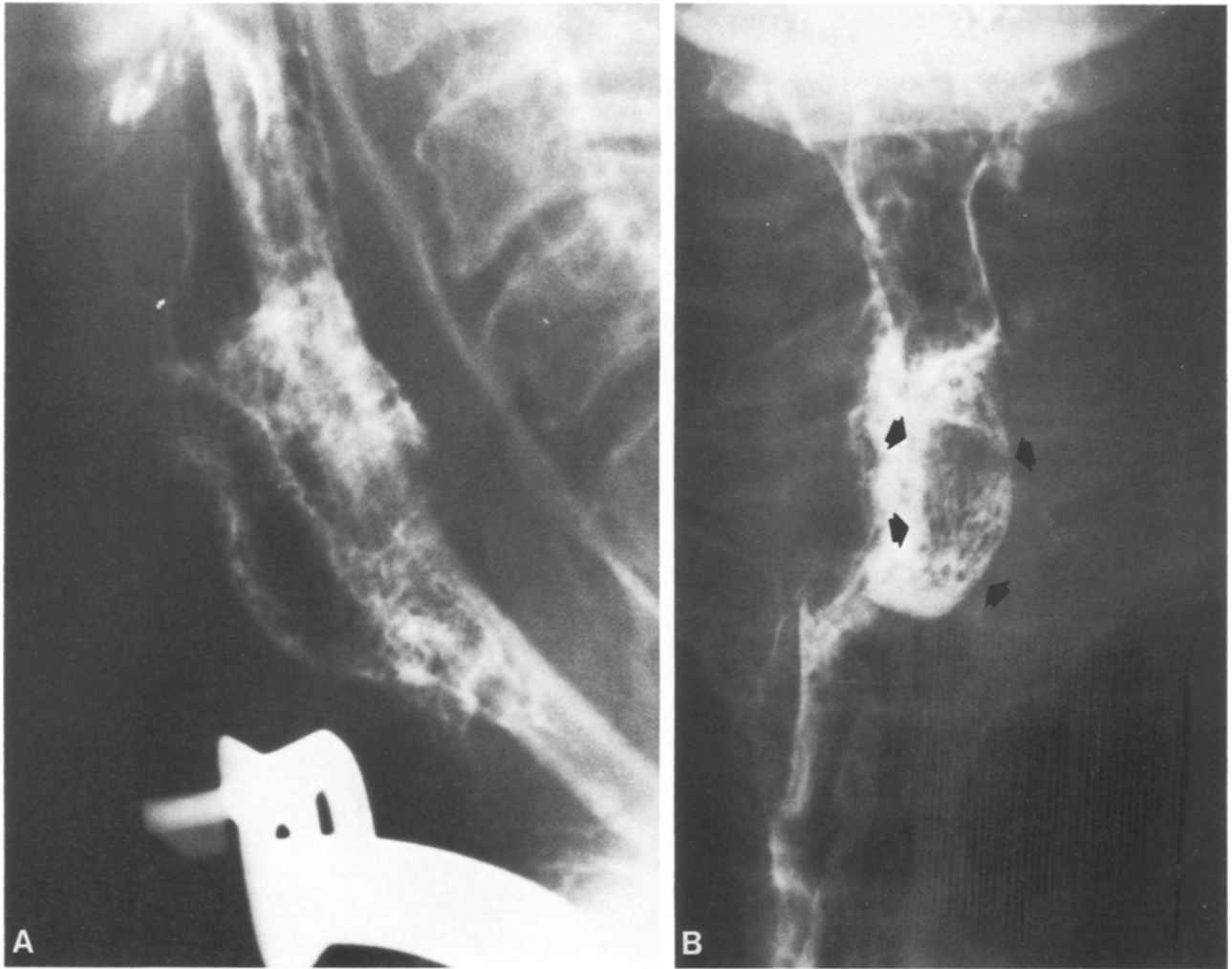
### Case Reports

#### Case 1

A 57-year-old white man complained of progressive cervical dysphagia of 3 years' duration. A barium swallow in March 1976 revealed an irregular constricting mass lesion in the cervicothoracic region of the esophagus. Endoscopy revealed an extramucosal mass about 21 cm from the incisors. Examination of a biopsy specimen of this mass from outside of the esophagus through a separate cervical incision confirmed the diagnosis of squamous cell carcinoma. On March 29, 1976, the patient underwent laryngopharyngo-esophagectomy with permanent tracheostomy and long-segment substernal colonic interposition. The postoperative course was complicated by necrosis of the colon graft secondary to venous thrombosis; therefore, the colon graft was taken down. The stomach was mobilized through the posterior mediastinum and brought up to the neck, where a pharyngogastric anastomosis was accomplished. An anastomotic leak with secondary cervical abscess required creation of a cervical fistula and separation of the pharynx from the stomach in the neck. Beginning in May 1976, he underwent a series of operations to reconstruct the cervical esophagus between the pharynx and already mobilized intrathoracic stomach. Multiple procedures involving rotation of cervical and deltopectoral skin flaps finally created a "skin tube esophagus" in the cervical region. The cervical salivary fistula was closed by primary repair using a muscle flap from the sternocleidomastoid. The final stage of the reconstruction of the endoesophagus was achieved in June 1977. Three months after this the patient began to complain of cervical dysphagia, that he could pull out large amounts of hair from his mouth, and that he choked on food.

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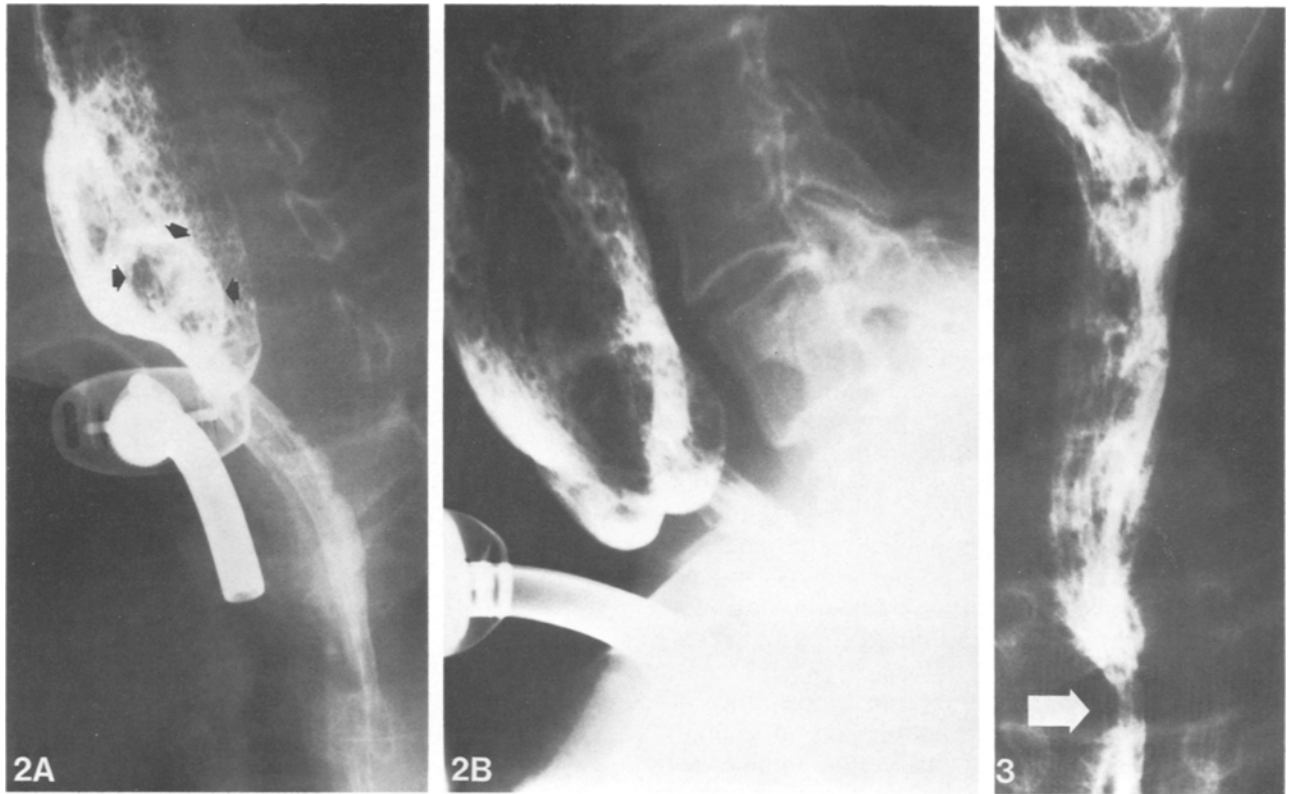
**Fig. 1.** *Case 1.* **A** A double-contrast study shows numerous small round filling defects in the endoesophagus and endohypopharynx; these represent hair follicles. **B** A repeat examination on a follow-up visit shows a large polypoid mass (*arrows*) representing a mass of hair (hairball) and numerous round filling defects

A barium swallow revealed numerous small round filling defects and a large polypoid mass in the endoesophagus (Fig. 1). Endoscopic examination confirmed the presence of exuberant amounts of hair growth and a large mass of hair in the reconstructed skin tube cervical esophagus. The patient first underwent endoscopic hair removal from the esophagus on September 23, 1977. After that he had periodic endoscopic hair removal every 4–6 months for the next 5 years. He continued to pull small amounts of hair from his mouth and dilated his “skin tube esophagus” himself frequently. When last seen in May 1983 he had no dysphagia or recurrence of tumor and did not complain of spitting of hair or choking spells. Apparently hair growth has ceased.

### Case 2

In 1980, a 63-year-old man complained of progressive hoarseness and dysphagia of 3 months' duration. Examination revealed a large mass in the larynx involving the hypopharynx. Examination of a biopsy specimen showed squamous cell carcinoma. A total laryngopharyngectomy, right radical neck dissec-

tion, and permanent tracheostomy followed by reconstruction of the hypopharynx and proximal cervical esophagus using medial deltopectoral skin flap were performed. The postoperative course was complicated by flap necrosis and required a 2-stage reconstruction of the pharynx and cervical esophagus using left-sided medial deltopectoral and lateral cervical skin flaps. Following successful “skin tube” reconstructive surgery the patient complained of recurrent dysphagia and required frequent dilatations during 1981. He continued to do well with “self-dilatations” until December 1983, when he was admitted to Veterans Administration Medical Center, Ann Arbor, with complaints of progressive dysphagia, hair-spitting, and choking spells. A barium swallow (Fig. 2) revealed numerous small round filling defects in the reconstructed endopharynx and stenosis of the pharyngoesophageal junction. Endoscopy revealed large amounts of hair growing in the skin tube endopharynx above the stenosed pharyngoesophageal junction. Hair was removed with a “cupped forceps” without complications. Following dilatation of the pharyngoesophageal stenosis and hair removal, the patient's symptoms were relieved and he was able to tolerate a regular diet.



**Fig. 2.** Case 2. **A, B** A double-contrast study shows numerous small round filling defects in the endopharyngo-esophagus. A large polypoid filling defect (arrows) is due to a mass of hair

**Fig. 3.** Case 3. A single view from a barium swallow shows numerous small round filling defects in the endopharyngo-esophagus and a stricture (arrow) at the distal anastomosis of the skin tube esophagus

### Case 3

A 56-year-old man underwent total glossectomy, laryngopharyngectomy, and left radical neck dissection for extensive squamous cell carcinoma of the tongue, followed by myocutaneous deltopectoral flap reconstruction of the hypopharynx and proximal cervical esophagus in March 1982. The postoperative course was unremarkable until July 1983, when he was admitted for right radical neck dissection for recurrence of tumor. He complained of progressive cervical dysphagia, spitting of hair, and episodes of gagging or choking. A barium swallow (Fig. 3) showed small round filling defects in the reconstructed skin tube endopharyngo-esophagus and stenosis of the distal anastomosis. Preoperative endoscopic examination revealed extensive hair growth associated with retained debris within the skin tube. The excess hair was removed with a "cupped forceps." No recurrent tumor was found at the anastomotic sites. Dilatation of the anastomotic site was performed prior to right radical neck dissection. He received radiation therapy postoperatively. When the patient was last seen in December 1983, there was no recurrence of hair growth.

### Discussion

The hypopharynx and cervical esophagus can be reconstructed following laryngopharyngo-esophagectomy by means of a variety of flap procedures.

Generally the medially based horizontal deltopectoral flaps augmented by lateral cervical flaps and split-thickness skin grafts are utilized for primary as well as secondary reconstruction [1, 2]. This flap is richly nourished by the perforating branches of the internal mammary artery and vein. Originally popularized by Bakamjian [4], the use of this flap has several advantages:

1. Delay flap is not necessary;
2. The flap is out of the field of preoperative radiation;
3. Excellent viability and not subject to venous congestion because of gravity drainage;
4. The flap is usually non-hair-bearing.

The most important precaution with the flap design is to be sure that no part of the surface destined to form the inner lining of the endopharyngo-esophagus is hair-bearing. If the donor sites are even sparsely covered with hair, this may be enough to negate the use of this tissue. The reconstructed tube is formed by rotating the skin flap to lie in the cervical region with the raw surface on the spine and the skin turned on itself so that

the outer epithelial surface becomes the inner lining. The upper end is end-to-end anastomosed to the pharynx and the lower end is similarly attached to the original esophagus or its visceral substitute. The epithelial surface does bear a few hair follicles, particularly in male patients. The hair follicles usually desquamate or atrophy. If hair does grow, it is sparse, usually asymptomatic, and growth ceases spontaneously within a year. Rarely, excessive hair growth occurs. Since skin is unable to produce mucus, the lining becomes dry and frequently crusts form. When the hair growth in the endopharyngo-esophagus is exuberant, the patients present with the classic clinical triad of progressive dysphagia, hair-spitting, and choking spells due to masses of hair. Under such circumstances periodic endoscopic hair removal becomes necessary. Our patient 1, similarly to the 2 previously reported cases [3], required an endoscopic "hair cut" as well as removal of masses of hair every 4-6 months for the next 5 years after initial completion of reconstructive surgery.

The characteristic radiographic appearance of "hirsute or bearded" endoesophagus on double-contrast examination consists of numerous rounded filling defects on the rough surface of the "skin tube esophagus" representing hair follicles. These defects are smaller than the usual air-bubble artifacts. Plaques due to moniliasis and herpes are

usually linear, irregular in shape, and slightly larger. The mass of hair appears as a large polypoid filling defect that changes its position in several projections. The classic clinical triad and characteristic radiographic appearance seen in our patients with "hirsute esophagitis" represent a unique and rare complication of skin tube reconstructive surgery. We have found only 1 report of "hairy esophagus" in the radiologic literature [3].

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