

# Squamous Cell Carcinoma Associated with Chronic Gastrostomy Tube

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<b>Background</b>	A 35-year-old male patient presented with gastrostomy tube-associated primary cutaneous squamous cell carcinoma with intraabdominal invasion 34 years following gastrostomy creation.
<b>Summary</b>	Our patient presented at age 35 with a circumferential mass surrounding his chronic gastrostomy feeding tube. He had a history of ATR-X syndrome and was dependent on gastrostomy tube feeding since one year of age. The mass had been growing gradually for nine months; however, evaluation was delayed due to the coronavirus pandemic. The patient underwent a skin biopsy that revealed locally advanced squamous cell carcinoma (SCC). Computed tomography of the abdomen showed a mass in the anterior abdominal wall surrounding the gastrostomy tube with the extension into the stomach. Upper endoscopy revealed an intraluminal gastric ulcerating mass surrounding the gastrostomy tube. Endoscopic biopsy revealed moderately differentiated squamous cell carcinoma. The patient subsequently underwent en-bloc resection involving the abdominal wall, anterior stomach, liver, and transverse colon wall. Final pathology revealed moderately differentiated squamous cell carcinoma. Chronic cutaneous inflammation is a risk factor for SCC in nonhealing wounds, such as in a Marjolin ulcer. Even though chronic inflammation with long-term gastrostomy is common, the incidence of associated cutaneous malignancy is rare and intraabdominal invasion of cutaneous malignancy has not yet been reported. This case underscores the need for surveillance of long-term gastrostomy and consideration of SCC in the differential diagnosis to evaluate nonhealing gastrostomy site wounds.
<b>Conclusion</b>	Local cutaneous malignancy associated with chronic gastrostomy tubes is rare. We present a case of gastrostomy site SCC with intraabdominal invasion presenting 34 years following gastrostomy creation. This case highlights the need for life-long surveillance of gastrostomy tube sites and consideration for cutaneous malignancy when chronic local inflammation is present.
<b>Key Words</b>	squamous cell carcinoma; gastrostomy tube; complication

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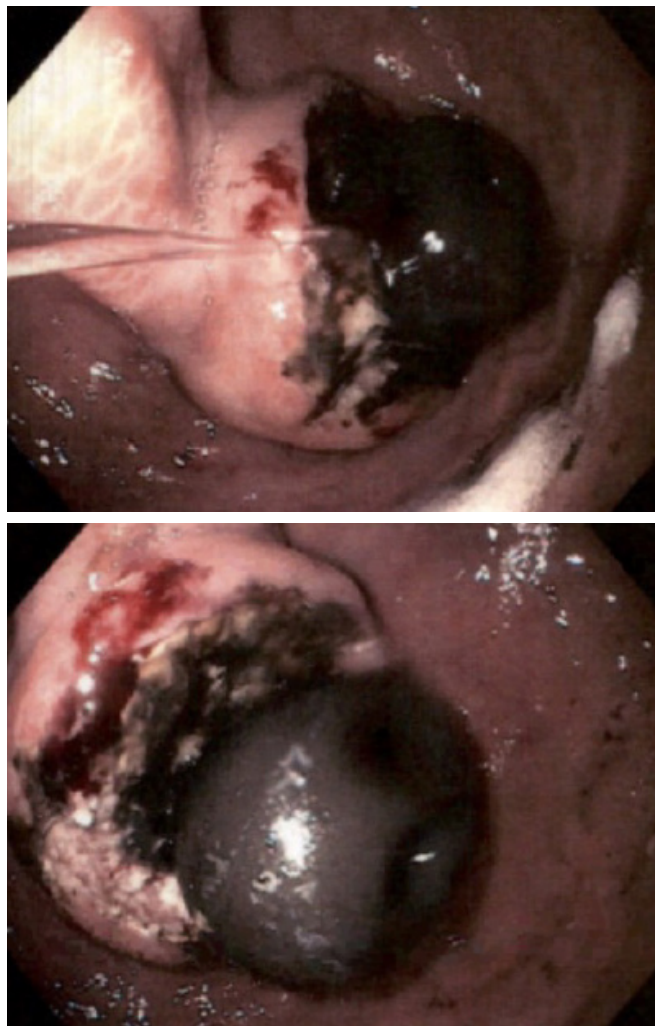
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## Case Description

A 35-year-old male with a history of alpha-thalassemia x-linked intellectual disability (ATRX), failure to thrive, and dependent on gastrostomy tube feeding since one year of age presented with a fungating mass surrounding his gastrostomy tube. Due to the coronavirus pandemic, evaluation of the lesion was delayed until the following year. On initial evaluation, the exophytic mass was found to be approximately 5 × 6 cm circumferentially surrounding the gastrostomy tube, and punch biopsy confirmed moderately differentiated squamous cell carcinoma (SCC). CT scan of the abdomen and pelvis demonstrated 3.7 × 3.1 cm soft tissue density in the left anterior abdominal wall surrounding the gastrostomy tube as well as 2.1 × 3.2 cm soft tissue density in the stomach adjacent to the feeding tube, which appeared to represent an extension of the cutaneous malignancy. There was no radiographic evidence of metastatic disease. The patient underwent upper endoscopy revealing an intraluminal, ulcerated mass circumferentially surrounding the gastrostomy tube and appearing to grow in from the outside (Figure 1). Endoscopic biopsies demonstrated invasive, focally keratinizing, moderately differentiated SCC.

The patient underwent definitive surgical treatment via en bloc resection of the mass. One-centimeter margins were taken grossly in all directions of the tumor edge. The intraabdominal portion of the mass required an anterior gastrectomy, which was kept continuous with the cutaneous mass and separated from normal-appearing stomach using electrocautery. The cephalad margin of the tumor was abutting the lateral segment of the left lobe of the liver, which was divided using electrocautery. Lastly, an additional margin was densely adherent to the transverse colon and required division with a linear stapling device oriented longitudinally not to violate the colonic lumen. The resected specimen contained the old gastrostomy tube, the entire tumor, and involved portions of the stomach, liver, and colon (Figure 2). The resulting gastrostomy was repaired, and a new gastrostomy tube was placed and sited at healthy tissue at the right anterior abdominal wall. Reconstruction of the abdominal wall defect was achieved with a local advancement flap in conjunction with the placement of 15 × 15 cm Strattice mesh, and a wound vac was placed.

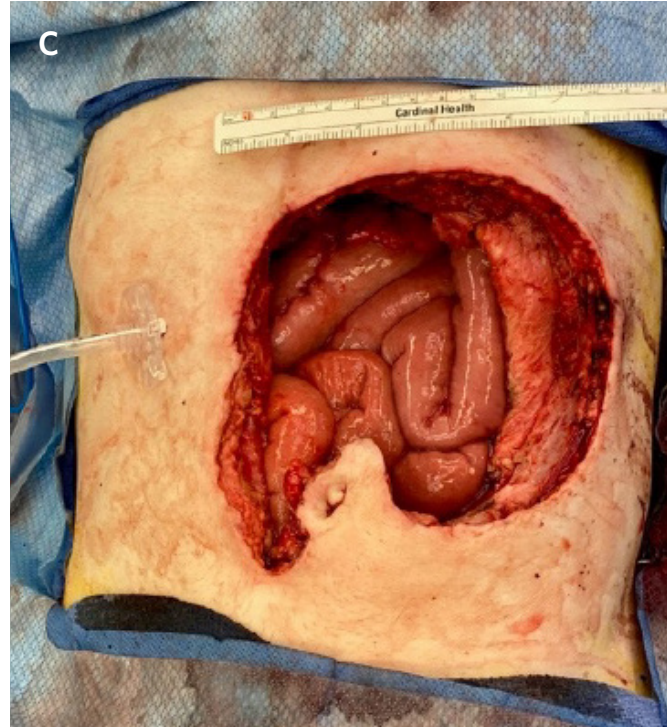
**Figure 1.** Endoscopic Images of Intraluminal Mass. Published with Permission



*Intraluminal view of anterior gastric wall with chronic gastrostomy balloon and surrounding invasive mass.*

On postoperative day 5, a gastrostomy tube study confirmed the correct placement of the tube in the gastric lumen, and the patient was started on tube feeds, which were well tolerated. The patient's postoperative course was complicated by pneumonia, but he was eventually discharged home with the wound vac in place on postoperative day 16.

Pathology revealed the operative specimen was an ellipse of skin excised to a depth of 8 cm, invading through the soft tissue to the gastric mucosa and superiorly into liver tissue. Skin margin, mucosa margin, and liver margin were negative for carcinoma. A single cauterized margin superiorly,

**Figure 2.** Intraoperative Images. Published with Permission

A) Cutaneous squamous cell carcinoma surrounding gastrostomy tube; B) specimen of en-bloc resection; and C) resultant abdominal wall defect with newly-sited gastrostomy tube

likely representing tissue retraction from the thermal energy used to divide the muscle, showed a tumor approaching the specimen edge. Considering potential side effects related to the skin, the gastric pouch, and the patient's inability to lie still, adjuvant radiation was forgone after discussion with the patient's mother, as the risks were considered to outweigh the benefit.

## Discussion

SCC associated with a gastrostomy tube is rare. There are reports describing gastrostomy-associated SCC in patients with head and neck cancer through the theoretical process of tumor seeding during percutaneous endoscopic gastrostomy (PEG) placement;<sup>1</sup> however, in practice, this is not commonly seen. SCC arising as a primary malignancy associated with chronic gastrostomy tube is reported even less frequently. To our knowledge, only three prior reports have described local cutaneous SCC associated with chronic gastrostomy tubes. In one report, a 60-year-old male developed SCC associated with a PEG tube while on immunosuppressive therapy after heart-liver transplantation. In this case, the patient developed a gastrocutaneous fistula after the removal of the PEG tube that did not

improve with local therapies and required surgical excision revealing a well-differentiated SCC.<sup>2</sup> A second case report describes a 73-year-old male with a history of esophageal exclusion and gastrostomy tube after a chemical burn injury 50 years prior, who developed a painful exophytic mass. The patient required wide local excision, which revealed well-differentiated SCC.<sup>3</sup> Lastly, a third case report describes a 24-year-old male with chronic seizure disorder and gastrostomy tube since two years of age who acutely developed granulation tissue that persisted despite local therapies. The patient required surgical excision, which revealed well-differentiated SCC.<sup>4</sup>

In all three reports of primary SCC at gastrostomy tube sites, the cutaneous malignancy did not involve intraabdominal organs (confirmed preoperatively with endoscopy and at operative exploration) and was amenable to treatment with wide local excision alone (with negative margins confirmed on pathology). Likewise, these prior cases were associated with smaller, well-differentiated tumors. In our patient, his cutaneous malignancy was moderately differentiated, and the time to diagnosis was delayed secondary to social barriers, which likely contributed to the locoregional advancement of his primary SCC into abdominal organs.

Chronic, cutaneous inflammation has been implicated in the development of SCC in other cases of chronic inflammation, including SCC associated with ileostomy,<sup>5</sup> hidradenitis suppurativa,<sup>6</sup> and burn scars.<sup>7</sup> Similar to the malignant degeneration that occurs in a Marjolin ulcer, it is hypothesized that in these settings, persistent inflammatory states may cause mutations in DNA that eventually give rise to neoplasm. Furthermore, SCC associated with Marjolin ulcers are more aggressive than other primary SCCs and carry higher tendencies for recurrence and distant metastasis.<sup>8</sup>

As such, all sites of chronic inflammation should be viewed as high risk for the development of cutaneous malignancy, including sites of chronic gastrostomy tubes. Long-term complications of chronic gastrostomy tubes have been identified, including tube dislodgement, buried bumper syndrome, granulation formation, local wound infection, and peristomal leakage;<sup>9</sup> however, the cascade from chronic granulation and local inflammation or infection to development of cutaneous malignancy has not been widely acknowledged as a potential long-term complication. Chronic wounds, including sites associated with

chronic gastrostomy tubes, should carry concern of malignant degeneration in settings of poor healing, necrosis, or persistently raised granulomatous edges. The threshold for biopsy in this setting should be low.<sup>9</sup> Monitoring for complications associated with gastrostomy tubes should not be limited to perioperative and short-term surveillance and should span the lifetime and duration of gastrostomy tube use.

## Lessons Learned

States of chronic inflammation, including local sites surrounding gastrostomy tubes, harbor an increased risk for malignant degeneration and the development of cutaneous malignancy. In this setting, SCC can be locally aggressive. Chronic gastrostomy tubes requiring life-long monitoring and consideration for local SCC should be considered in the differential for site-associated, nonhealing wounds.

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