Palliative concurrent chemoradiation for gastrostomy site metastasis

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Patients with head and neck squamous cell carcinoma typically present with dysphagia, odynophagia, and weight loss. Treatment of the disease with surgery or concurrent chemoradiation often results in local inflammation and limits further oral intake. Percutaneous endoscopic gastrostomy (PEG) has been a common and effective means of nutritional support in these patients. An estimated 200,000 PEGs are performed annually in the United States, with head and neck cancer patients comprising up to 5% of those procedures.[1]

A French retrospective study that evaluated a total of 139 consecutive patients treated for stage III-IV head and neck squamous cell carcinoma, showed that nutritional status at the end of treatment was unchanged from initial nutritional status in the PEG group.[2] In the same study, the cumulative incidence of treatment interruption from toxicity was significantly lower in the PEG group than in the no-PEG group (100 and 236 days of interruption, respectively, $P = .03$) and hospitalization was significantly shorter in the PEG group ($P = .003$). In a retrospective review of 297 patients, Strom and colleagues reported independent risk factors for PEG tube placement in patients undergoing chemoradiation as the following: accelerated irradiation fractionation (odds ratio[OR], 4.3; 95% confidence interval [CI], 1.1-16.5; $P = .04$), a tumor T classification of 3 or higher (OR, 3.5; 95% CI, 1.0-11.9; $P = .04$), a cumulative cisplatin ≥200 mg/m^2 (OR, 6.7; 95% CI, 1.2-36.7; $P = .03$), and a body-mass index ≤25 kg/m^2 (OR, 5.8; 95% CI, 1.4-23.9; $P = .02$).[3]

Although PEG has gained its wide acceptance as an efficient method of providing enteral nutrition in patients with head and neck carcinoma, PEG site metastasis remains a rare but valid concern. It was first reported by Preyer and Thul in 1989,[4] and the frequency is estimated to range from 0.5%-1%.[5] In this article, we report a case of PEG site metastasis with meaningful response to concurrent chemoradiation. We also discuss the common PEG insertion methods and the risks of metastasis, and review prevention and treatment strategies.

Case presentation and summary

A 54-year-old man with 40 pack-year smoking history presented with dysphagia and a weight loss of 20 lb over a year. An initial computed-tomography (CT) scan revealed a neoplasm at the right tonsil measuring 3.1 x 2.2 x 5.9 cm, involving the posterior pharynx and hypopharynx bilaterally and with necrotic contralateral level IIb lymphadenopathy. He underwent PEG using the Gauderer-Ponsky (pull) technique simultaneously during the diagnostic laryngoscopy. The biopsy confirmed squamous cell carcinoma. He was treated with definitive concurrent chemoradiation of 70 Gy in 35 fractions, with 2 cycles of cisplatin 100 mg/m^2 for stage IVA (T4N2cM0) oropharyngeal cancer, p16 negative.

A positron-emission tomography scan obtained 3 months after completion of therapy showed no evidence of active disease. However, 13 months after the completion of definitive chemoradiation, the patient complained of pain and bleeding from the PEG site. Physical examination revealed no evidence of primary oropharyngeal cancer, but with a new 4- x 4.5-cm exophytic component of an abdominal wall mass (Figure 1). Metastatic spread of squamous cell

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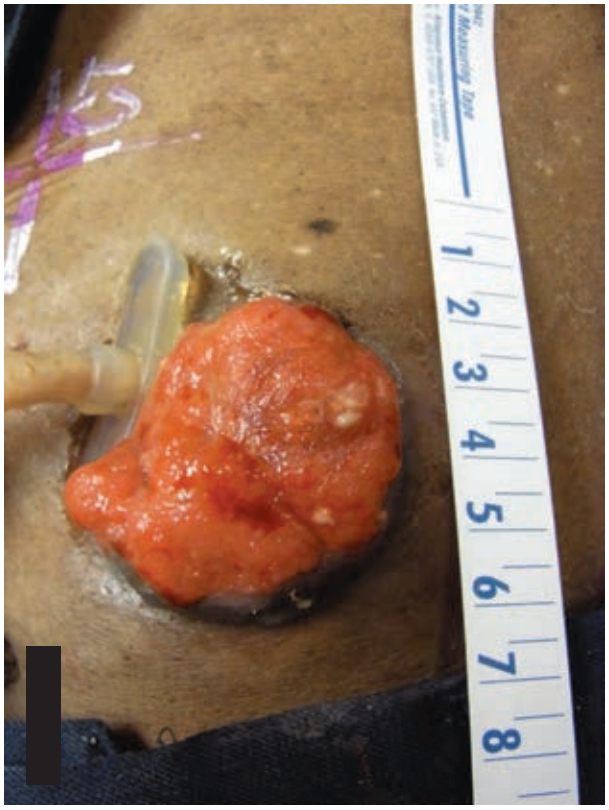

FIGURE 1 Appearance of the percutaneous endoscopic gastrostomy site 13 months after completion of definitive chemoradiation. A new 4- x 4.5-cm exophytic component of the abdominal wall mass was found.

carcinoma was confirmed through a biopsy of this site. The paptient was also found to have concurrent liver metastases. His laboratory tests revealed normal values except for an albumin level of 3.2 g/dL and creatinine of 1.5 mg/dL. His Karnofsky Performance Status Scale score was 90 (range, 0-100; 0, dead and 100, normal; 90, minor signs or symptoms of disease but able to carry on normal activity). He then received palliative chemoradiation with weekly carboplatin at AUC 2 concurrently with 50.4 Gy in 28 fractions, followed with 10 Gy in 5 fractions boost electron radiation therapy focused at the PEG site to alleviate pain and control bleeding.

Several weeks afterward, pain and bleeding from the PEG site metastasis resolved. The visible portion of the PEG site metastasis significantly improved (Figure 2), thereby dramatically reducing local skin irritation and therefore improving the patient's quality of life. About 14 months after the completion of palliative concurrent chemoradiation, the PEG tube became dislodged because of fistula formation. However, pain and bleeding was kept to a minimum until the patient died 21 months after the diagnosis of PEG site metastasis ultimately due to progression of disease.

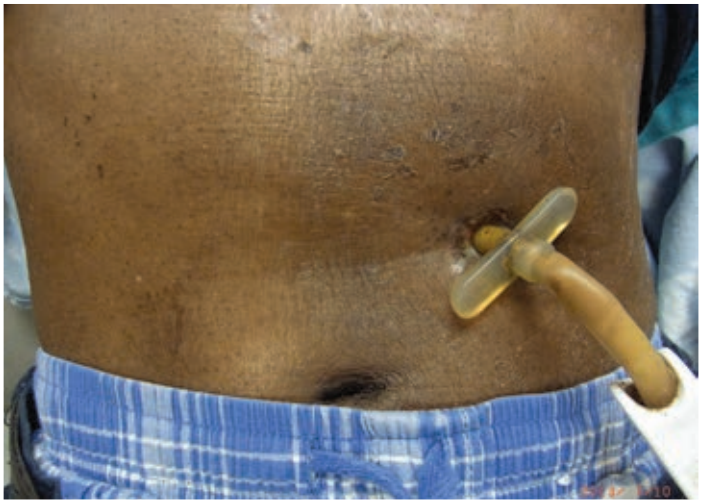

FIGURE 2 Physical exam several weeks after completion of palliative chemoradiation to the metastasis at the percutaneous endoscopic gastrostromy site. The abdominal wall mass was no longer seen.

Discussion

PEG tube insertion techniques

There are 3 common techniques for PEG tube insertion. The first 2, the Gauderer-Ponsky (pull) and the Russell (push) techniques, require passage of a flexible endoscope through the esophagus and into the stomach. The third technique, the radiologically inserted gastrotomy (RIG), does not require use of an endoscope.

During the pull technique, a guidewire is inserted through the abdominal wall under endoscopic guidance. The gastrostomy tube is then secured to the transoral end of the wire and pulled through the patient's mouth and abdominal wall by pulling the extra-abdominal end of the wire. The push PEG technique is based on the Russell introducer method – after the endoscope is inserted and the PEG site is marked, a short guidewire is passed transabdominally and visualized with the endoscope. Serial dilators are passed over the guidewire to create a stoma tract, and the gastrostomy tube is pushed over the guidewire through the abdominal wall.[6]

The RIG method is similar to the push technique but does not require endoscopy. RIG was first described by Tao and Gillies in 1983. A nasogastric catheter is inserted and under fluoroscopic observation the stomach is insufflated with air. A needle puncture is then performed through the anterior abdominal wall into the stomach and, following serial dilatation, the gastrostomy tube is inserted.

Mechanisms of PEG site metastasis

There are several theories for the pathogenesis of PEG site metastasis. The most common cause of PEG site metastasis seems to be direct spread or seeding of the neoplasm during endoscopic procedure. Huang and colleagues have

reported in a case series that 28 of 29 cases (96.6%) of PEG site metastasis in patients with PEG insertion reported the use of the Gauderer-Ponsky (pull) technique.[7] Ellrichmann and colleagues performed a prospective study by evaluating the brush cytology of PEG tubing and transcutaneous incision immediately after PEG insertions. In that study, malignant cells were present in 22.5 % of patients immediately after pull-through PEG placement,[8] supporting the direct seeding pathogenesis.

Although PEG site metastasis is much more common with the Gauderer-Ponsky (push) technique, a case of puncture site metastasis in a radiologically inserted gastrostomy tube has been reported by Hawkin and colleagues.[9] Although the authors stated that the exact cause was unknown, they proposed consideration of hematogenous spread and/or the possibility of natural shedding of tumor cells. Brown and colleagues have supported the theory of hematogenous and or lymphatic spread of tumor cells.[10]

Prevention and treatment of PEG site metastasis

Most cases of PEG site metastasis that have been reported were performed using the Gauderer-Ponsky (pull) technique. Although not entirely safe, the RIG technique may be a better approach. Lin and colleagues have proposed that for patients with head and neck cancer, a barrier should be placed between the tumor and the instrumentation. However, they did not specifically discuss the barrier.[11] Huang and colleagues have argued 89% of PEG site metastases in their case series occurred in patients who had undergone PEG before definitive therapy and have suggested further research looking at the benefit of deferring PEG placement until after the initiation of radiotherapy or tumor resection. In their study, average time to death from detection of PEG metastasis was 5.9 months and 1-year survival after PEG metastasis was 35.5% with an overall mortality of 87.1%.[7] Given the grave prognosis, early detection is crucial. All patients with PEG should have their site examined at every visit.

In our case, PEG site metastasis was successfully brought under control with concurrent chemoradiation. Few case reports have documented chemoradiation as the treatment modality for PEG site metastasis. Adelson and colleagues reported a case of PEG site metastasis that was treated with 2 cycles of ifosfamide, paclitaxel, and carboplatin and abdominal wall radiation, which was without response.[12] Coletti and colleagues also reported a case of PEG site metastasis in which treatment with chemoradiation was initiated, but the patient decided to abort therapy after only a few treatments.[13] Potochny and colleagues reported a case of PEG site metastasis that was treated successfully with wide excision,[14] but often times, patients are not suitable surgical candidates by the time they are diagnosed with PEG site metastasis.

Although PEG site metastasis is a rare occurrence, it remains a concern. Pain and bleeding from PEG site metastasis can significantly decrease the quality of life for these patients, and their symptoms should be managed to the utmost. Chemoradiation provided a sustained response of local symptom control in our patient without significant adverse effects. The combination of chemotherapy and radiation therapy in patients with PEG site metastasis can be an effective option as a potentially sustainable palliative strategy, significantly improving patient quality of life with minimal side effects.

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