

# Effect of video-based education on percutaneous endoscopic gastrostomy tube use duration: A case report

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## ABSTRACT

Percutaneous endoscopic gastrostomy (PEG) is a safe, practical, and effective method for enteral nutrition. Minor and major complications may occur after the placement of a PEG tube. In the content of the education provided to caregivers, information should be given about the potential complications and the importance of communicating with the nutrition support team when these issues arise. In this case, we present a patient who was fed through a PEG tube and experienced infections and hypergranulation tissue processes during a thirty-seven-month follow-up, which included one tube replacement. Through this case, we aim to demonstrate that minor complications associated with the PEG tube can be addressed without hospitalization, through collaboration between the patient and the nutrition support team, allowing for an extended period of PEG tube usage.

**Keywords:** Hypergranulation, infection, percutaneous endoscopic gastrostomy, video-based education

## INTRODUCTION

Percutaneous endoscopic gastrostomy (PEG) is the procedure of placing a tube into the stomach to provide enteral nutrition for patients who cannot be orally fed for an extended period when the gastrointestinal system is active.<sup>1</sup> Early and late complications may arise after PEG tube placement, including infection, bleeding, peristomal leakage, tube obstruction, buried bumper syndrome, and inadvertent tube dislodgment.<sup>1,2</sup> Most of these complications can be prevented with proper care. It is crucial for PEG tube care providers, such as nutritional nurses and healthcare personnel, to have adequate knowledge of PEG care, duration of use, and potential complications.

PEG education should be comprehensive, covering both care and potential complications. Practical demonstrations of PEG dressing application should be provided, with caregivers performing the dressing at least once under the supervision of a nurse. Care-related videos should be

watched, and caregivers should be informed about the importance of promptly communicating with the nutrition support team when complications arise. Patient discharge should be planned after the completion of these training sessions.

This case aims to illustrate that minor complications of PEG tubes can be effectively managed without hospitalization through the collaborative efforts between the patient and the nutrition team. This approach enables the prolonged use of the PEG tube.

## CASE REPORT

Thirty-seven months ago, a 91-year-old bedridden woman diagnosed with cerebrovascular disease underwent her initial PEG tube placement. The patient was discharged ten days after hospitalization. Around one month later, the caregiver observed signs of infection (odorous discharge, redness) at the PEG tube insertion site. The caregiver captured an image of the dressing and shared it with

the nutrition team doctor, a gastroenterology specialist. Considering the absence of fever and no deterioration in the general condition, the nutrition team doctor prescribed topical antibiotics as the first-line therapy. To facilitate at-home application, the nutrition nurse provided verbal instructions and showed an educational video on topical antibiotic application to the caregiver. This video prepared by the nutrition nurse included wiping the entry site of the PEG tube with povidone iodine gauze and drying it with a new gauze, applying the recommended antibiotic-containing pomade to the gauze cut in Y-shape and placing it under the PEG tube plate. On the fifth day, the caregiver reported no discharge at the PEG tube entry site during a phone follow-up. The PEG tube was replaced after eighteen months of use.

In the thirteenth month following the PEG tube replacement, hypergranulation tissue developed at the insertion site of the new tube (Figure 1). The caregiver was called to the hospital and given a silver nitrate stick to use at home. A training video demonstrating the process of using the silver nitrate stick to burn the hypergranulation tissue was shown to the caregiver. The insertion site of the PEG tube healed after the caregiver applied the silver nitrate stick once a day for two days at home (Figure 2). Currently, the patient is in the nineteenth month of using the replaced PEG tube and plans to continue using it as long as there is no deformation of the tube (Figure 3, 4).

## DISCUSSION

The PEG tube was initially introduced by Gauderer in 1980.<sup>1</sup> After PEG tube placement, patients may experience both minor and major complications. Major complications include pulmonary aspiration, peritonitis, perforation, hemorrhage, gastrocolocutaneous fistulas, buried bumper syndrome, and necrotizing fasciitis, while peristomal infection and tube obstruction are the most common minor complications.<sup>2</sup> According to the recommendations of the Society for Nutrition and Metabolism (2022), regular replacement of the PEG tube is unnecessary unless deformation occurs.<sup>3</sup>

### Main Points

- PEG is a safe, practical, and effective method for enteral nutrition.
- Effective communication between caregivers and the nutrition nurse eases the management of minor PEG complications.
- With proper care, long-term use of the PEG tube is possible.

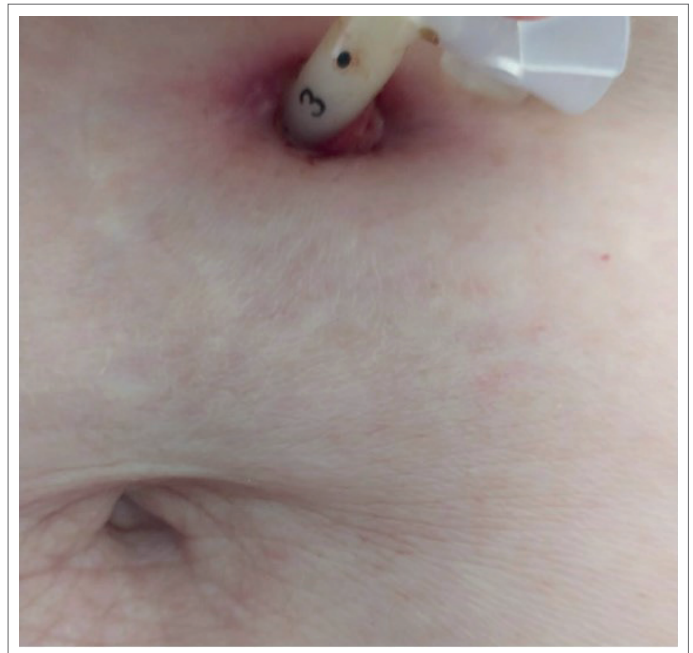


Figure 1. The appearance of hypergranulation tissue at the insertion site of the PEG tube at thirteenth month



Figure 2. Hypergranulation tissue appearance of the PEG tube entry site burned with silver nitrate

Peristomal infections are prevalent in patients with PEG tubes, particularly in those with diabetes, obesity, malnutrition, and those on chronic corticosteroid or immunosuppressive therapy. Prevention strategies involve wound care and early recognition of signs of infection,

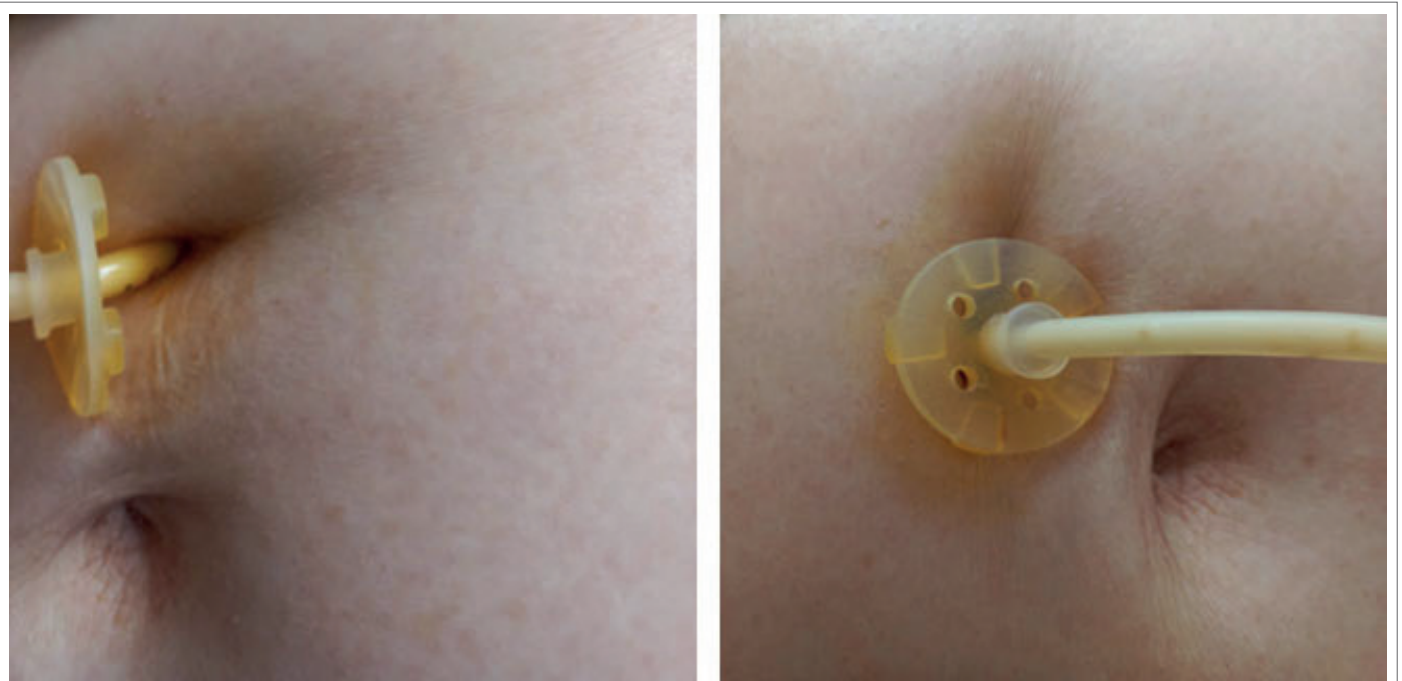


Figure 3, 4. Appearance of the second PEG tube at nineteen month

including odorous discharge, erythema, fever, and pain. Topical antibiotics are recommended for treatment.

Comprehensive education is provided to caregivers of patients undergoing their first PEG tube insertion at our hospital. This includes verbal explanation, a written document, and watching a video demonstrating PEG tube dressing. Additionally, the nutrition nurse performs the PEG dressing in the presence of the caregiver, who then applies the dressing independently one day later. The duration of this PEG care education session is approximately 120 minutes. Caregivers are provided with the contact number of the nutritional support team for any complications that may arise post-discharge.

In the case presented, topical antibiotic dressing was explained verbally and a practical video was shown to the caregiver of the patient, who developed peristomal infection, by the nutrition nurse in the hospital. The content of the infected PEG tube dressing education is as follows; the entry site of the PEG tube is wiped with povidone iodine gauze (gauze that does not leave threads) and dried with a new gauze. The recommended antibiotic-containing pomade is applied to the gauze cut in a Y-shape and placed under the plate of the PEG tube.<sup>3,5</sup>

Hypergranulation tissue is a common complication in patients with a PEG tube, characterized by vascular tissue that bleeds easily and causes pain. The underlying reasons for its development include excessive moisture, friction, leakage, infection, and a foreign body reaction to

the PEG tube. Treatment options include applying topical antimicrobial or silver-containing pomade under the PEG tube plate. Alternatively, cauterization directly on the skin with silver nitrate can be performed, typically over a 7–10-day period in combination with topical antibiotics.<sup>3,4</sup>

In this particular case, for the management of hypergranulation tissue, the caregiver was instructed not to apply the silver nitrate stick on healthy skin. Instead, they were advised to touch the stick to the hypergranulation tissue for a few seconds and to do this once a day. A video demonstrating the burning process with a silver nitrate stick was shown to the caregiver. Following the cauterization, it was explained that the dressing should be wiped dry with povidone iodine approximately 4-5 hours later. The patient used the first PEG tube for eighteen months and is currently in the nineteenth month of using the second PEG tube. The expectation is to continue using the same PEG tube as long as it remains free from deformation.

The durability of the PEG tube primarily depends on careful handling, and there is generally no requirement for regular tube changes at fixed intervals. Conditions that may necessitate PEG tube replacement include a deformed tube, buried bumper syndrome, and necrotizing fasciitis.<sup>3,4</sup> Regular assessment and vigilance regarding the tube's condition, along with prompt attention to any signs of potential issues, contribute to prolonging the effective use of the PEG tube.

## CONCLUSION

In this case, the complications involved peristomal infection and hypergranulation tissue, both of which were successfully managed in the patient's home environment through communication with the nutritional support team. The effective management of complications underscores the importance of nutrition nurses having sufficient knowledge of PEG care and the management of associated complications.

In order to address complications in patients undergoing PEG tube follow-up, it is crucial to provide comprehensive training to caregivers by nutrition nurses before discharge. Despite the common occurrence of the need for PEG tube replacement at shorter intervals, such as every six months in many cases, this case report demonstrates that a collaborative effort between caregivers and nutrition nurses can enable long-term PEG tube use. The inclusion of written, oral, practical, and video-based components in the education provided to caregivers is essential to ensure the prolonged and successful use of the PEG tube.

**Informed consent:** Permission was obtained from the patient for the use of the pictures and case presentation.

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