

Percutaneous Endoscopic Gastrostomy Infection: 10% Povidone Iodine Miracle

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ABSTRACT

Gastrostomy is the procedure of inserting a tube through the abdominal wall into the stomach in order to provide nutrition in cases where gastrointestinal system functions are normal but oral intake is not sufficient and enteral nutrition is predicted to take more than 4-6 weeks. Gastrostomy was first introduced in 1980. Although minor complications such as peristomal infection and infiltration, pneumoperitoneum, gastrointestinal bleeding and ulceration may be seen due to gastrostomy; Major complications such as necrotizing fasciitis, colocutaneous fistula and aspiration may also occur. In the literature, 1-4% minor and 8-30% important results related to gastrostomy are reported. Peristomal, which is one of the gastrostomy minor examinations, can already be treated with close and good care. In our case report, infections that may occur at the gastrostomy insertion site were reported, possible causes were discussed, a case with a diagnosed with peristomal infection and treated with povidone iodine solution (baticone/betadine) was presented, and the literature on the subject was compiled.

Keywords: Gastrostomy, infection, patientcare, povidone-iodine

INTRODUCTION

The process of placing a feeding tube from the point where the stomach is opened into the stomach in the patients, who have a functional gastrointestinal tract but cannot be fed adequately, is called gastrostomy.¹ Gastrostomy is widely used because it is easy to insert, inexpensive, and complications can be prevented.² Infections after gastrostomy procedure can be seen as peristomal, abdominal wall abscess, and necrotizing fasciitis.³ Peristomal infections may occur due to foreign body reactions in the gastrostomy region, and its incidence is reported to be 15% in the literature. Peristomal infections can be successfully treated with appropriate wound care and antibiotic therapy.⁴ Factors such as lack of antibiotic prophylaxis, host factors (malnutrition, obesity, diabetes, malignancy), drug treatments (immunosuppressive drug, chronic corticosteroid therapy), excessive traction between the inner plate and the stomach wall, and inadequate dressing predispose to infection.⁵ While the first of these measures is antibiotic prophylaxis administered 30 minutes before the procedure, the second is oral care with chlorhexidine.^{6,7}

It has been determined in the studies performed that the prevalence of peristomal infection decreased from 29% to 7% with a single dose of broad-spectrum antibiotic administration 30 minutes before the gastrostomy procedure.² In a study by Koca and Tarım (2019), in which the effect of pre-procedural oral care on peristomal infection in patients who underwent gastrostomy was evaluated, it was reported that 23.5% of the patients who did not receive oral care before gastrostomy application developed peristomal infection. In the same study, peristomal infection was found in 10.8% of the patients who underwent oral care before gastrostomy.⁸ The third preventive measure is based on early detection of signs and symptoms of infection (erythema, purulent and/or foul-smelling exudate, fever, and pain). Routine skin care and antimicrobial pomades should be used to treat peristomal infections. If there is hair in the tube placement area, cutting it using an electric shaver is also recommended as part of infection precautions.⁶

Povidone-iodine has fast bactericidal, sporicidal, tuberculocidal, virucidal, and fungicidal effects on the applied

surface. The antimicrobial effect of iodine is rapid even at low concentrations, but the exact mode of action is unknown.⁹

The most commonly used agents in skin antisepsis are alcohol-based chlorhexidine gluconate and povidone-iodine solutions, which are effective against a wide variety of bacteria, fungi, and viruses. There are no evidence-based recommendations for the agent to be used in skin antisepsis in the published guidelines for the prevention of surgical site infections.¹⁰

In this case report, a case diagnosed with peristomal infection and treated with 10% povidone-iodine solution is presented together with the literature in order to emphasize the importance of patient care in the prevention of peristomal infection.

CASE PRESENTATION

A 86-year-old male, married patient with dementia was operated with the diagnosis of coccyx fracture as a result of falling. While he was bedridden for 6 months, he continued his treatment in the intensive care unit for 25 days with aspiration pneumonia. The patient, who was fed with a gastrostomy tube for 3 months after the intensive care treatment, applied to the emergency department due to redness and discharge at the gastrostomy site, and was interned in the palliative care unit for support purposes (Figure 1). The patient's admission laboratory values were C reactive protein: 3.7 mg/L, white blood cell: 8.26 μ L, and albumin: 29.3 g/dL. Ceftriaxone was administered intravenously (IV) once daily. Enteral nutrition has been continued since the patient's admission.

Until the seventh day of hospitalization in the palliative care unit, a pomade containing sodium fusidate was dressed and covered with sterile gauze. As the patient's gastrostomy port infection did not improve despite the dressing made with sodium fusidate-containing ointment and intravenous ceftriaxone treatment, a consultation with the nutrition nurse was requested by the physician in charge of the palliative care unit on the seventh day of



Figure 1. In percutaneous endoscopic gastrostomy tube, discharge at the entry site and developed redness around it.

his hospitalization. The patient was advised by the nutrition nurse to wipe the dressing with 10% povidone-iodine twice a day and leave the gastrostomy site open. On the 10th day of dressing with 10% povidone-iodine, it was observed that the redness in the gastrostomy area was completely gone and there was no discharge (Figure 2). The patient was discharged on the 14th day.

DISCUSSION

The first dressing of the gastrostomy tube should be done 24 hours after the procedure. Hands should be washed and non-sterile gloves should be worn.¹¹ Gastrostomy care should be done by cleaning with aseptic (0.9% sodium chloride, sterile water, or boiled chilled water) sterile gauze for the first 5–7 days and the area should be kept dry. The gastrostomy site should be monitored daily for signs of inflammation such as bleeding, pain, redness, induration, and leakage.^{7,12-14} Sterile gauze (without



Figure 2. The appearance of the gastrostomy tube and its surroundings after the application.

Main Points

- The use of non-woven gauze in the care of gastrostomy is important for the prevention of possible infections.
- The most important issue in the prevention of gastrostomy infections is the frequent education of patients and their relatives with visual and auditory materials.
- In the treatment of gastrostomy infections, local applications such as povidone-iodine and systemic antibiotics provide satisfactory results.

shedding fibers) should be placed under the outer plate as a Y dressing. Care should be taken that the dressing is not tight when sterile gauze is placed under the outer pad. After the gastrostomy site has healed (about 1 week later), the stoma site should be cleaned twice a week using sterile gauze, boiled cooled drinking water (or sterile water) and soap, rinsed, and then left open after the skin is gently dried completely.

In addition, dressing with glycerin hydrogel or glycolgel is recommended for gastrostomy care. After 1 week, the tube should be returned to its starting position with some free distance (0.5–1 cm) between the skin and the outer support.¹⁴ While it is recommended in the literature to rotate the plate at the gastrostomy site 360° after the first 24 hours to prevent the embedded buffer syndrome.⁶ In the home enteral nutrition report published by ESPEN in 2020, it is recommended that the plate of the tube should not be rotated 360° for the first week, but rotated every day after the gastrostomy tract has healed (about a week later) and move it inward at least once a week (minimum 2 cm, maximum 10 cm) and bring it to the same position.¹⁴ Traction is not necessary for the first 24 hours of the gastrostomy to better adapt the stomach to the abdominal wall. It is recommended that the patient take a shower (attaching a waterproof tape) after a few weeks.^{7,14}

In the study conducted by Avcı and Otku¹⁵ (2017) in which they evaluated the antibacterial activities of some antiseptics and disinfectants, povidone-iodine (10%) was reported to be the most effective antiseptic, which inhibits the growth of all bacteria on *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, methicillin-resistant *Staphylococcus aureus* (MRSA), and vancomycin-resistant *Enterococcus* bacteria. In the study by Yiğit et al (2020) in which they investigated the place of sodium hypochlorite in the treatment of orthopedic infections, it was reported that all bacteria in *Staphylococcus aureus* and *Staphylococcus epidermidis* strains died after 2 minutes of exposure with povidone-iodine (0.35%).¹⁶ Again, in the same study, it was found that all bacterial strains died when exposed to povidone-iodine (0.35%) for 5 minutes.¹⁶ Kayan and Altan¹⁷ reported that 10% povidone-iodine solution was effective only against *Escherichia coli*, *Staphylococcus epidermidis*, and *Pseudomonas aeruginosa* strains in their study investigating the antimicrobial activities of some disinfectants and antiseptics frequently used in hospitals. It was found that 10% povidone-iodine solution showed antimicrobial effect against all strains except *Staphylococcus epidermidis* strain at 5 minutes.

Şimşek¹⁸ (compared the susceptibility of MRSA and methicillin-sensitive *Staphylococcus aureus* (MSSA) isolates

to various antiseptic and disinfectant agents and reported that the most effective antiseptic against MSSA and MRSA strains was povidone-iodine (10%).¹⁸

When peristomal infection is suspected or diagnosed, the antimicrobial agent is applied topically to the entry site of the tube. However, if the infection does not resolve despite this treatment, systemic broad-spectrum antibiotics should be used. At the same time, the gastrostomy area can be treated with antimicrobial ointment or a dressing containing a sustained release antimicrobial agent (e.g., foams, hydrocolloids, or alginates).¹⁴ In case of peristomal leakage of gastric contents from the stoma site, care with zinc oxide-based skin protectants is recommended.¹⁴ Our case was diagnosed with gastrostomy port infection, and despite the sodium fusidate ointment and ceftriaxone (IV) treatment, the infection findings continued, and the area was wiped with 10% povidone-iodine twice a day and kept dry, within the scope of expert opinion. On the 10th day of the application, the signs of infection in the gastrostomy area completely disappeared (Figure 2).

After the patient is discharged, it is important for more competent and high-quality care to provide support to caregivers through written or visual materials to prevent complications or to provide early treatment when complications develop.¹⁴ Caregivers should be advised to begin home gastrostomy care after 1 week and clean every other day with boiled chilled drinking water (or sterile water) and then thoroughly dry the area. In a study conducted by Green et al¹⁹ (2019) evaluating the problems experienced by caregivers of patients with feeding tubes regarding tube care, it was reported that more than half of the participants stated that they had to cope with problems with little or no support and that they did not know whom to contact for help in tube management.

In conclusion, we consider that 10% povidone-iodine solution is effective in the treatment of peristomal infection, as in our case. We believe that providing gastrostomy care when a peristomal infection develops by using 10% povidone-iodine solution by nutrition nurses and all nurses who care for gastrostomy will reduce the signs of infection. In this context, it is recommended to consolidate the research data by making more case series. In addition, gastrostomy care should be taught to caregivers practically by following evidence-based practices by nutrition nurses and health professionals. Dressing training should be planned by evaluating the education, age, vision, and hearing abilities of the caregiver. The patient's gastrostomy dressing should be done by the nutrition nurse after explaining it to the caregiver. The caregiver should be encouraged to do the second dressing of the patient and should be observed by the nutrition nurse.

The caregiver should be supported for all procedures performed during gastrostomy dressing. Written instructions on gastrostomy care should be prepared in accordance with the cognitive and educational level of caregivers. Photos and dressing videos should be included in the training materials as needed.

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