PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN ADVANCED HEAD AND NECK CANCER

Gastrostomia endoscópica percutânea em pacientes com tumores avançados de cabeça e pescoço

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INTRODUCTION

Patients with head and neck tumors are frequently unable to receive food through the mouth. This condition causes a nutritional deficit and contributes to therapy failure. Gastrostomy performed percutaneously with the aid of endoscopy has become the chosen procedure rather than conventional surgical gastrostomy due to being easier, safer and with less morbidity. Percutaneous endoscopic gastrostomy (PEG) is widely executed throughout the world by means of the pull technique, as proposed by Gauderer et al., in 1980. This PEG technique is relatively simple to perform, especially when commercially available kits are used. However, it has inherent problems caused by the passage of the gastrostomy tube through the oral cavity. Some complications are the high risk of peristomal wound infection and the risk, however small, of tumor implantation in the gastrostomy site, when the procedure is performed in patients with head and neck cancers. Additionally, these kits are expensive, especially for the low income population, and the Unified Brazilian Public Health System – SUS does not provide for the reimbursement of this material.

Several authors have proposed a variety of alternatives, aiming the reduction of peristomal infection risk, of which decrease the already low risk of tumor implantation in the gastrostomy site, and use resources which reduce procedure cost. However, doubts persist with regards to these technical variants. An important concern is if they are adequate for routine use, since they are more technically complex.

The aim of the present study was to assess the feasibility, safety and morbidity of a PEG performed through a well-defined standardized technique, described below, in patients with nonresectable recurrences or advanced tumors of the head and neck, who were unable to eat.

METHODS

Since February 2003, patients who needed a PEG from our institutions had their tubes implanted through a two-stage standardized technique. The first stage consisted of the application of two stitches aiming to fixate the anterior gastric wall to the abdominal wall, and the second, consisted of the introducer technique, used to insert the gastrostomy tube.
After the endoscopy, the patient was placed in the supine position and once the stomach was adequately insufflated, the insertion point was identified by transillumination and palpation of the abdominal wall.

Using an aseptic technique along with topical anesthesia with lidocaine, two punctures of about 3 cm apart were made with long needles (JELCO® I.V. Catheter 14G – Medex Medical Ltd, Rossendale, Lancashire, UK) that perforated the abdominal and the gastric walls. One of the needles contained a 2-0 nylon thread that came out from the inserted extremity. The other needle contained a 2-0 nylon thread loop that also came out from the extremity (Figure 1a). With a snare, the nylon thread was brought through the nylon loop (Figure 1b and 1c) that grasped the nylon thread and brought it back to the skin surface (Figure 1d) in such a way as to obtain a transfixion stitch in “U”. This procedure was then repeated in order to obtain a second parallel stitch, 2 cm apart from the first stitch (Figure 1e), being the same suture method proposed in 1999 by Kiser et al.18.

The stomach having been properly fixated to the abdominal wall by means of the two stitches, a cutaneous incision was made between them (Figure 2a). Then, curved Metzenbaum scissors (Figure 2b) were used to dissect the abdominal wall, thereby creating a path towards the gastric wall.

The next step was to puncture the gastric lumen using a trocar introducer with a peel-away sheath (Figures 3a and 3b) which allowed the insertion of the gastrostomy tube through the sheath (Figure 3c) and the total removal as well (Figure 3d). Latex Foley 16 Fr. catheters were used in each case.

All the procedures were performed by two doctors in the endoscopy room, with patients under conscious sedation, monitored by a pulse oximeter. Supplementary oxygen was used when necessary. Antibiotic prophylaxis was not used. For conscious sedation variable doses of diazepam 5 to 10 mg or of midazolam 3 to 10 mg associated or not to variable doses of meperidine 0 to 100 mg were used. The authors used the staging scale proposed by the International Union Against Cancer27. This study included patients with advanced head and neck tumors (Stage III or Stage IV) or with nonresectable recurrences. The data referring to the tumor site, staging, indication, complications and perioperative mortality were analyzed. This study was accepted and approved by the review board of the local institution.
RESULTS

From February, 2003 to May, 2004 a 129 PEGs were performed under this technique. This study included 60 patients with nonresectable recurrences or advanced head and neck tumors.

The indication of a PEG was the fact that these patients could not be fed through the mouth. In 47 of the cases this was due to dysphagia; the second most frequent impediment was postoperative salivary fistulas (eight cases); followed by bronchoaspiration (four cases) and nasal regurgitation (one case). The age range was between 36 and 82 (median 57 years). There were 49 men and 11 women in this group (4.4:1).

In our series only 28 patients had had a tracheostomy. Two patients with hypopharynx malignancies had active tumors, which caused stenosis and did not allow the endoscope to pass through. Therefore, endoscopic dilatation had to be performed before the PEG was implanted. Table 1 shows the anatomical sites of the tumors and their corresponding stages.

### TABLE 1 - Anatomical site and clinical stages

<table>
<thead>
<tr>
<th>Stage grouping</th>
<th>Stage III</th>
<th>Stage IV</th>
<th>Non Stage III</th>
<th>Recurrence</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral cavity</td>
<td>3</td>
<td>11</td>
<td>--</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>Hypopharynx</td>
<td>1</td>
<td>10</td>
<td>1</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Oropharynx</td>
<td>2</td>
<td>8</td>
<td>--</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Larynx</td>
<td>4</td>
<td>6</td>
<td>--</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Nasopharynx</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td>Paranasal sinuses</td>
<td>--</td>
<td>2</td>
<td>--</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>Salivary glands</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11</td>
<td>40</td>
<td>2</td>
<td>9</td>
<td>62</td>
</tr>
</tbody>
</table>

† Two patients with synchronous tumors, in the oral cavity and in the oropharynx
‡ Cannot be assessed. Two patients had advanced disease, however there were no elements that could help define if they were stages III or IV

Four patients had a second metachronous tumor, since they had had their first head and neck neoplasms treated and under control for more than 6 months. Their anatomical sites can be found in Table 2.

### TABLE 2 - Metachronic tumors

<table>
<thead>
<tr>
<th>First tumor (already treated)</th>
<th>Second tumor (current)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larynx</td>
<td>Nasopharynx</td>
</tr>
<tr>
<td>Larynx</td>
<td>Hypopharynx</td>
</tr>
<tr>
<td>Lip</td>
<td>Larynx</td>
</tr>
<tr>
<td>Oral cavity</td>
<td>Hypopharynx</td>
</tr>
</tbody>
</table>

All the patients received food on the same day, after they had effectively recovered from the sedation.

Morbidity and mortality related to this procedure are listed in Table 3. The most significant complication was respiratory failure in three patients and in all of them the PEG was successful. The respiratory failure of the first patient in this group was a result of respiratory depression caused by medication. This specific patient needed orotracheal intubation and was hospitalized in the intensive care unit for 6 days, before he finally died. The respiratory failure in the second patient was attributed to extrinsic compression caused by the tumor of the hypopharynx. Introducing the endoscope only made it worse. This patient was orotracheal intubated in the endoscopy room, the PEG was performed and then he was sent to the operation room for a tracheostomy. The third patient could not be intubated and a tracheostomy was executed in the endoscopy room.

There were three complications caused by infection. One case of pneumonia, and another of peristomal wound infection, both were successfully treated with systemic parenteral antibiotic therapy. A third infection-related complication was a case of peritonitis caused by the leakage of gastric secretion around the feeding tube, to the peritoneal cavity. This patient underwent laparotomy to adequate fixation of the gastric wall to the abdominal wall.

### TABLE 3 - Procedure-related morbidity and mortality

<table>
<thead>
<tr>
<th>Morbidity</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory failure</td>
<td>3</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>1</td>
</tr>
<tr>
<td>Infection of the surgical wound</td>
<td>1</td>
</tr>
<tr>
<td>Peritonitis</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6 (10%)</td>
</tr>
</tbody>
</table>

DISCUSSION

PEGs are procedures that have been frequently performed worldwide, since being described in 1980 by Gauderer et al.\textsuperscript{10}. Many others had been used it with small variations\textsuperscript{3,12,30}. Its widespread use is due to the fact that it is an easy procedure and results in low morbidity. It is also very convenient for administering food and medication at home.

Several authors\textsuperscript{3,12,30} have successfully performed PEGs in patients with tumors of the head and neck, using the pull technique proposed by Gauderer et al.\textsuperscript{10}. The question under discussion is whether the technical options that do not require the passage of the tube through the oral cavity would be safer.

The first description of the technique for implanting a gastrostomy tube through alternative paths other than the oral cavity dates from 1967 and was performed by Jascalevich\textsuperscript{16} in dogs. In 1979 Sacks et al.\textsuperscript{26} did the same procedure in a patient and in 1981 Preshaw\textsuperscript{27} reported on a series of 11 patients. These three authors did the gastrostomy percutaneously using radioscopy. Since then, in specially trained centers and with experts in interventional radioscopy some authors have performed this procedure in patients with tumors of the head and neck\textsuperscript{2,6}. These authors advocate the advantage of the reduced risk of tumoral implantation in the surgical wound, as well as the reduced risk of postoperative infection, thus making antibiotic prophylaxis unnecessary.

There have been several reports of tumoral implantations in the surgical wound of PEGs performed according to the pull technique, in patients with malignant neoplasms...
of the head and neck. The incidence of this complication, previously unknown, has recently been established by Cruz et al. as being 0.92%. Several authors have recommended the introducer technique for PEGs done in patients with tumors of the head and neck, in order to avoid this complication.

There is another technical variant in which the gastrostomy tube is introduced percutaneously under endoscopic view and, as a consequence, the tube does not go through the oral cavity. This variant was originally described in 1980 by Hashiba. In 1984, this technique was standardized and publicized by Russell et al. It was later adopted by other authors who introduced some technical modifications. All the PEGs included in our series used this method.

Two reports compare the pull technique to the introducer technique executed with the aid of endoscopy. Their authors report that the latter is more technically difficult and results in higher complication rates. Another recent study also compares these two techniques in patients with advanced cancer of the head and neck. These authors used a system of fixing the gastric wall and they concluded that the introducer technique should be the method of choice in this patient population, since it is associated to a significant reduction of complications, when compared to PEGs performed according to the pull technique.

The purpose of the stitches is to make the procedure safer, relative to the leakage risk of the gastric content. In 1980, Hashiba was the first to describe the suture of the gastric wall. It was first performed in dogs and in a small series of ten patients. Some years later a larger series was presented. Dormann et al. described a device that he used successfully in 27 patients and which seemed to make suturing easier. Other methods for fixing the stomach wall by means of T-shaped fixators or a Fogarty embolectomy catheter have also been described. Ours series uses a modified suture technique proposed in 1999 by Kiser et al. This suture technique uses low cost medical supplies that are frequently used and therefore, are readily available. Additionally it is relatively easy to perform. We believe that this fixation is important, especially in patients with advanced neoplasms, whose nutritional status is usually poor. The stitches do not eliminate the need of a careful follow up, since one of the patients in ours series presented leakage of the gastric content into the abdominal cavity.

The use of antibiotic prophylaxis has been considered mandatory for PEGs performed according to the pull technique and several prospective randomized studies have confirmed this need. Even with antibiotic therapy, the rate of local infections is not negligible since it ranges from nine to 12%. Conversely, and when using this introducer technique, several authors consider a course of antibiotics unnecessary. Antibiotic prophylaxis was not used in this study and the rate of local infection was considered low (1.6%), and when present, was successfully treated with antibiotics.

There were three cases of respiratory failure during the PEG in our series, representing 5% of the group and this complication is mentioned by Gibson et al. Patients with tumors of the head and neck which have not undergone a tracheostomy should be carefully evaluated for the purpose of determining the need of a preoperative procedure.

Morbidity and mortality rates resulting from the procedure described here fall within acceptable limits and indicate that it is a safe procedure. The data that is present here represent the initial experience with this method and express the initial phase of the learning curve. Therefore, the expectation is that even better results will be obtained as the learning curve advances.

CONCLUSION

The introducer technique is both feasible and safe as it can be performed in an outpatient clinic and the patient can receive a food on the same day. An additional benefit is that there is no need to administer antibiotic prophylaxis. Furthermore, this technique is associated to low morbidity and to acceptable mortality rates.


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