

Profile, recommendation criteria, and outcome of gastrostomy tube insertions in a pediatric teaching hospital

Luise Alexandre Rocha Soutinho¹, Danyelle Araujo Fontes¹, Yonatta Salarini Vieira de Carvalho², Mariana Pinheiro Brendim², Charles Henrique Dias Marques³

ABSTRACT

Objective: To describe the profile of patients undergoing a gastrostomy, the recommendations and outcome of this insertion in a Pediatric Teaching Hospital. **Method:** This was a retrospective, quantitative, and descriptive study that researched the records of patients who underwent a gastrostomy between January 2010 and December 2012. **Results:** The diseases and conditions most frequent were chronic infantile encephalopathy (77.5%), pneumonia (67.5%), seizures (57.5%), and malnutrition (42.5%). Although most patients presented a history of dysphagia (62.5%), oral feeding was observed most frequently as the most common form of nutrition, before the gastrostomy insertion (42.5%), followed by nasoenteric tube (40%). The introduction of nutrition by gastrostomy was successful and occurred an average of 2.82 (\pm 1.19) days after insertion. Six months after their gastrostomy, 80% of patients continued feeding only through this access tube and only 2.5% had removed the gastrostomy; 45% of the participants had gastrostomy complications, with extravasation of gastric material (15%) and local inflammation (15%) being the most frequent. **Conclusion:** The profile of patients undergoing gastrostomy is mostly of individuals with neurological and respiratory diseases, without respiratory support, of the male gender, and feeding by oral cavity or nasoenteric tube for a prolonged period. The main recommendation criteria were dysphagia and neurological diseases. Regarding the outcome, the introduction of nutrition by gastrostomy was successful; most individuals remained with this long-term nutritional support and the most common complications were gastric material extravasation and local inflammations.

Keywords: Gastrostomy, Deglutition Disorders, Nutritional Support

¹ Speech therapist graduated from the *Universidade Federal do Rio de Janeiro* Federal University of Rio de Janeiro – UFRJ.

² Speech therapist, Assistant Professor at the *Faculdade de Medicina* School of Medicine, Universidade Federal do Rio de Janeiro – UFRJ.

³ Speech therapist, Assistant Professor at the *Faculdade de Medicina*, Universidade Federal do Rio de Janeiro – UFRJ.

Mailing address:

Instituto de Puericultura e Pediatria Martagão
Gesteira - Universidade Federal do Rio de Janeiro
Luise Alexandre Rocha Soutinho
Rua Bruno Lobo, 50
CEP 21941-912
Rio de Janeiro - RJ
E-mail: luiseale02@yahoo.com.br

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INTRODUCTION

Gastrostomy is a long term alternative feeding method, with the objective of guaranteeing nutrition and/or fluids, thus avoiding the malnutrition and/or dehydration of the patient. A gastrostomy is recommended in cases where there is no intestinal obstruction, but where, for some mechanical and/or neurological reason, the individual is unable to feed orally. Also, it can be recommended as a safe and effective way to administer medication.¹

It is a procedure that consists of inserting a tube directly into the stomach of the patient, through an opening made in the abdominal wall,¹ and it can be done through surgery, laparoscopy, or endoscopy.²

Its recommendation, whether for adults or children, is due to the prolonged use of a feeding tube as an alternative nutritional support. According to specialized literature, this alternative tends to increase the risk of contamination, in addition to complications such as obstruction, dislodging, laryngeal irritation, and also discomfort for the patient.³ The need for a gastrostomy as a feeding alternative is frequent in patients with dysphagia - alterations in deglutition.

Dysphagia is the alteration in the safe transportation of the food bolus from the mouth to the stomach. There are neurogenic and mechanical types of dysphagia,⁴ depending on the etiological factor that determines the condition. In this way, individuals with congenital anomalies and/or serious neurological impairments may present this type of feeding difficulty,⁵ and thus need to have an alternative method of feeding and hydration be recommended.

In general, there are no great risks in the insertion of a gastrostomy tube. It is a simple procedure and only in some cases may cause infections, fistulas, or hemorrhages, among other complications.⁶ The literature reports that the patients submitted to this procedure are, in their majority, those who already present serious pathologies and, for that reason, are susceptible to greater risks.⁷

However, the recommendation criteria for gastrostomy in children may be more complex, for deglutition is a process that also involves aspects related to quality of life, eating pleasure, and the personal values of each individual. In addition, out in daily life we can see family resistance to accepting the gastrostomy, where it is essential to explain the benefits and risks involved in this procedure to the persons responsible for those patients. The

need is therefore justified to develop studies that favor a better understanding of the profile of patients submitted to a gastrostomy, the recommendation criteria, and the possible complications of this technique.

OBJECTIVE

The present study proposed to describe the profile of patients submitted to the insertion of a gastrostomy tube in a teaching pediatric hospital, mentioning the main diseases or underlying conditions that those individuals presented. Also, it had the objective of analyzing the recommendation criteria and outcome of such an insertion, including the complications found in this procedure.

METHOD

This was a retrospective, quantitative, and descriptive study, made through researching the records of patients who had undergone a gastrostomy insertion at the *Instituto de Puericultura e Pediatria Martagão Gesteira (IP-PMG)* from the Universidade Federal do Rio de Janeiro (UFRJ), between January of 2010 and December of 2012. The exclusion criteria for this study were: patients who had been previously gastrostomized, those submitted to a procedure of exchanging their gastrostomy in the period of the investigation; and those without any description of the information on the gastrostomy insertion procedure in their records. A form created specifically for this study was used to help in collecting data (Figure 1). In this form, information on the patient's profile was collected along with the recommendations to have a gastrostomy and the outcome of the insertion.

To describe the profile and recommendation criteria for gastrostomy, the following aspects were investigated:

- Gender;
- Age: age of the individual at the time of the gastrostomy procedure;
- Diseases or underlying conditions: diseases or underlying conditions described in the medical record before the gastrostomy;
- Feeding pathway before the gastrostomy: (I) oral ingestion, (II) nasogastric tube, (III) nasoenteric tube, (IV) orogastric tube, (V) oroenteric tube, (VI) parenteral nutrition, or (VII) ignored when it was not described in the medical record. In addition, the number of days on alternative nutritional support was analyzed;

- Respiratory condition before the gastrostomy: (I) ambient air, (II) oxygen therapy, (III) tracheotomy, (IV) tracheotomy associated with mechanical ventilation, (V) orotracheal tube, (VI) non-invasive ventilation, or (VII)-ignored when it was not described in the medical record;

- History of dysphagia: (I) yes, (II) no, or (III) ignored, according to a positive or negative answer, or absence of report in the medical record of any history of dysphagia such as coughing, throat clearing, or choking related to deglutition/feeding before the gastrostomy;

As for the outcome, the following aspects were analyzed:

- Introduction of nutrition via gastrostomy: (I) yes, when it was possible to introduce nutrition via gastrostomy after the procedure, (II) no, when it was not possible to introduce nutrition via gastrostomy after the procedure, and (III)-ignored when this information was not described in the medical record. The time between the introduction of nutrition through gastrostomy and the procedure was also analyzed;

- Complications from gastrostomy: (I) yes, (II) no, or (III) ignored, according to a positive or negative answer, or absence in the report of any complications from the gastrostomy in a period up to 6 months after the procedure. Complications reported in the medical records were also described;

- Evolution of nutritional support after gastrostomy: nutritional pathway 6 months after the procedure - (I) continuation of gastrostomy - full gastrostomy, (II) continuation of gastrostomy associated with oral pathway, (III) removal of gastrostomy - full oral pathway, and (IV)-ignored when there was no description of this information in the medical record;

- Respiratory condition after the gastrostomy: respiratory condition between 1 to 6 months after the procedure - (I) ambient air, (II) oxygen therapy, (III) tracheotomy, (IV) tracheotomy associated with mechanical ventilation, (V) orotracheal tube, (VI) non-invasive ventilation, or (VII)-ignored when such condition was not described in the medical record.

The data were treated through descriptive statistical analysis. This study was approved by the Ethics and Research of the IPPMG at the UFRJ under protocol No. 397.748.

RESULTS

In the investigation period of the study, 51 medical records of patients who had undergone a gastrostomy were included. Of those, 11 were excluded, since 4 had no description of the gastrostomy insertion and 7 were not available in

Medical Record Number: _____	Date of Birth: ___/___/_____
Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female	Age: _____
Diseases or underlying conditions:	
- Prematurity <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
- Seizures <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
- Gastroesophageal reflux <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
- Encephalopathy <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
- Malnutrition <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
- Metabolic disease <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
- Dehydration <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
- Progressive Spinal Muscular Atrophy <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
- Pneumonia <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
- Asthma <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
- Others _____	
Data pre-gastrostomy	
Nutritional support:	
- Oral ingestion <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> refuses <input type="checkbox"/> ignored	
- Alternative pathway <input type="checkbox"/> NGT <input type="checkbox"/> NET <input type="checkbox"/> OGT <input type="checkbox"/> OET <input type="checkbox"/> PTN <input type="checkbox"/> ignored	
- Time using alternative pathway: ___ days <input type="checkbox"/> ignored	
History of dysphagia: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
Respiratory condition:	
<input type="checkbox"/> ambient air <input type="checkbox"/> O2 <input type="checkbox"/> TCT <input type="checkbox"/> TCT+MV <input type="checkbox"/> OTT <input type="checkbox"/> NIV <input type="checkbox"/> ignored	
Data post-gastrostomy	
Date of insertion of the gastrostomy: ___ / ___ / _____	
Type of procedure performed: <input type="checkbox"/> surgical <input type="checkbox"/> percutaneous	
Outcome:	
<input type="checkbox"/> Date of Death: ___ / ___ / _____	
<input type="checkbox"/> Introduction of nutrition via gastrostomy	Date: ___ / ___ / _____ <input type="checkbox"/> ignored
<input type="checkbox"/> Reintroduced to Oral Ingestion	Date: ___ / ___ / _____ <input type="checkbox"/> ignored
<input type="checkbox"/> Removal of gastrostomy tube	Date: ___ / ___ / _____ <input type="checkbox"/> ignored
<input type="checkbox"/> Gastrostomy with Oral Ingestion	Date: ___ / ___ / _____ <input type="checkbox"/> ignored
<input type="checkbox"/> Gastrostomy without Oral Ingestion	
Respiratory condition:	
<input type="checkbox"/> ambient air <input type="checkbox"/> O2 <input type="checkbox"/> TCT <input type="checkbox"/> TCT+MV <input type="checkbox"/> OTT <input type="checkbox"/> NIV <input type="checkbox"/> ignored	
Complications:	
Granuloma: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	Perforation: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored
Infection: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	Inflammation: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored
Extravasation of gastric material: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
Hemorrhage: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> ignored	
Other: _____	

Figure 1. Form for collecting data

the file. The final sample consisted of the medical records from 40 patients, with 14 females (35%) and 26 males (65%). The age bracket ranged from 3 months to 12.25 years, with an average of 3.86 (± 3.81) years and a median of 2.63 years.

Table 1 shows the frequency of diseases or underlying conditions present in the patients submitted to gastrostomy insertion. As shown in the table, the most frequent diseases and conditions

were: encephalopathy, pneumonia, seizures, and malnutrition. It is noteworthy that the present study was developed in a highly specialized pediatric care facility, where the population monitored may present with association of various co-morbidities. This aspect may have influenced the recommendation criteria and the results shown, in addition to justifying the difference found in the literature.

Table 2 describes the grouping of the different diseases and underlying clinical conditions. It is seen that neurological disease is a condition present in most patients submitted to a gastrostomy insertion, as well as respiratory disease. As pointed out before, it can be observed that a single individual may present with multiple diseases, that is, have diagnoses for one or more of the conditions mentioned.

Table 3 shows the nutritional pathway of the participants in the period before the gastrostomy was inserted. There is a similar percentage between the individuals fed orally (42.5%) and those being fed by an alternative nutritional pathway (45%). The time using the alternative nutritional pathway ranged from 14 to 98 days, with average of 41.44 days (± 27.55) and a median of 34 days. Table 4 shows the frequency of the respiratory conditions in the participants in the period before the gastrostomy was inserted. It was possible to verify that 27.5% of the patients needed ventilatory support or oxygen therapy, although a considerable portion of the sample (45%) needed no respiratory aid. Another aspect observed was that 22.5% of the individuals used invasive respiratory support in the period before the gastrostomy was inserted.

In relation to cases of dysphagia, 25 patients (62.5%) presented with episodes of coughing, throat clearing, or choking related to deglutition/feeding described in the medical records. Another 15 patients (37.5%) did not present with reports of signs or symptoms of dysphagia.

Table 5 shows, in the period after the gastrostomy, whether there was introduction of nutrition via gastrostomy. It was observed that the majority of the patients analyzed were introduced to nutrition via gastrostomy, and that this occurred an average of 2.82 days (± 1.19) after its insertion.

Table 6 shows the evolution of the nutritional pathway after the insertion of gastrostomy. Despite 17.5% of the patients gastrostomized returning to oral ingestion in up to 6 months after the procedure, most of them were fed exclusively via gastrostomy.

In relation to gastrostomy complications, 45% of the medical records described procedural complications. Table 7 highlights the complications presented by the patients up to 6 months after the gastrostomy was inserted. The most frequent complications were extravasation of gastric material and local inflammation.

Table 8 shows the respiratory conditions of the patients in the period between 1 and 6 months after the gastrostomy is inserted. It is possible to notice that 45% of the individuals needed respiratory support or oxygen therapy, with 35% of them using invasive support.

Table 1. Frequency of the diseases and underlying conditions

Diseases and underlying conditions	N	(%)
Encephalopathy	31	(77.5%)
Pneumonia	27	(67.5%)
Seizures	23	(57.5%)
Malnutrition	17	(42.5%)
Gastroesophageal Reflux	10	(25.0%)
Prematurity	9	(22.5%)
Cardiopathy	4	(10.0%)
Asthma	3	(7.5%)
Progressive Spinal Muscular Atrophy	3	(7.5%)
Laryngomalacia	3	(7.5%)
Dehydration	2	(5.0%)
Syphilis	2	(5.0%)
Sepsis	2	(5.0%)
Others*	1	(2.5%)
Total	40	(100%)

*Herpes, diabetes, tracheoesophageal fistula, high obstruction, microcephaly, hyaline membrane disease, bilateral inguinal hernia, urea cycle disorder, intracranial hemorrhage, subglottic stenosis, bronchopulmonary dysplasia, renal alterations, West syndrome, Niemann Pick syndrome, stroke, short bowel syndrome, gastritis, and human immune deficiency virus

Table 2. Grouping of the diseases or underlying clinical conditions

Conditions	N	(%)
Neurological	34	(85%)
Respiratory	28	(70%)
Digestive system conditions	24	(60%)
Prematurity	9	(22.5%)
Infectious diseases	4	(10%)
Cardiac	4	(10%)
Mechanical alterations	3	(7.5%)
Metabolic	3	(7.5%)
Renal	1	(2.5%)
Others	1	(2.5%)
Total	40	(100%)

Table 3. Frequency of the nutritional pathway in the period before the gastrostomy was inserted

Nutrition pathway	N	(%)
Oral ingestion	17	(42.5%)
Alternative pathway - NET	16	(40.0%)
Alternative pathway - NGT	2	(5.0%)
Ignored	5	(12.5%)
Total	40	(100%)

NET: Nasoenteric tube; NGT: Nasogastric tube

DISCUSSION

The results verified in the present study demonstrate that 65% of the sample was composed of male subjects. However, no theoretical basis was found for such prevalence.

This research was restricted to patients in the pediatric age group, ranging from 3 months to 12.25 years of age.

In the literature it is possible to find various studies that investigate diseases and underlying conditions present in gastrostomized patients. Neurological disease was the

main condition referred to in studies related to the insertion of a gastrostomy.^{6,8-12} It was followed by malnutrition,^{6,9,12,13} craniofacial anomalies,^{2,6} oncological diseases,^{2,6,9} and prematurity.^{9,10} In the present study, several of these were the underlying diseases found, however the majority of patients (77.5%) were diagnosed with encephalopathy. In addition to that, a high incidence of pneumonia (67.5%), seizures (57.5%), and malnutrition (42.5%) was found. In the analysis of the underlying conditions grouped by systems, neurological disease was found as the main condition present in patients submitted to the gastrostomy insertion (85%), which corroborates the data described in the literature.¹⁴

In the presence of multiple diseases, the risk for the development of dysphagia increases, which often aggravates the general state of the patient.¹⁵ The present study reinforces what was found in the literature, since 90% of the patients analyzed presented with multiple diseases or underlying conditions and, among those, 69.44% exhibited a history of dysphagia. In view of this fact, the recommendation of gastrostomy is even more evident, since it provides a better quality of life to those individuals, guaranteeing a form of feeding that is safer for those serious cases.

According to studies, the main recommendations for gastrostomy are related to the presence of dysphagia.^{2,6,8,9,10,13,15} The present study confirms this finding, for 62.5% of the patients analyzed presented with clinical signs of dysphagia (episodes of coughing, throat clearing, or choking related to deglutition/feeding) described in their medical records. However, this value could have been underestimated, since only patients who described clinical signs of dysphagia were included. Thus, it is possible that other children presented with these signs, although with no description or report.

The recommendation for gastrostomy is a challenge for the professionals involved in the care of patients with dysphagia. Currently, there are discussions on the often uncertain benefits, impacts on the quality of life and survival of the patients.¹⁶ It is important to remember that a gastrostomy may lead the patient to emotional, psychological, and social disorders that many times are not taken into consideration at the time of recommendation.¹⁴

However, it should be inferred that the presence of other alternative pathways may cause even more disturbances since, esthetically, it is less acceptable. In addition, deprivation of food ingested orally is a social factor that can also psychologically affect those individuals.

Table 4. Frequency of respiratory conditions in the period before the gastrostomy

Respiratory condition	N	(%)
Ambient air	18	(45%)
O2	2	(5%)
TCT	1	(2.5%)
TCT+MV	3	(7.5%)
OTT	5	(12.5%)
NIV	0	(0%)
Ignored	11	(27.5%)
Total	40	(100%)

O₂ - oxygen; TCT - tracheotomy; MV - mechanical ventilation; OTT - orotracheal tube; NIV - non-invasive ventilation

Table 5. Introduction of nutrition via gastrostomy

Introduction of nutrition via gastrostomy	N	(%)
Yes	39	(97.5%)
No	0	(0%)
Ignored	1	(2.5%)
Total	40	(100%)

Table 6. Evolution of the nutritional pathway after the insertion of gastrostomy

Evolution of nutritional pathway	N	(%)
Continuation of gastrostomy - full gastrostomy	32	(80%)
Continuation of gastrostomy - associated with oral ingestion	6	(15%)
Removal of gastrostomy - full oral ingestion	1	(2.5%)
Ignored	1	(2.5%)
Total	40	(100%)

Table 7. Complications

Complications	N	(%)
Extravasation of gastric material	6	(15%)
Inflammation	6	(15%)
Obstruction	2	(5%)
Granuloma	2	(5%)
Migration of gastrostomy tube	2	(5%)
Leakage of secretion	2	(5%)
Infection	2	(5%)
Others*	1	(2.5%)
Ignored	22	(55%)
Total	40	(100%)

* Problems in the tube and hemorrhage

Studies have shown that in the pediatric population, the most recommended alternative way to feed is the nasogastric tube (NGT).² However, the nasoenteric tube (NET) is also used with less frequency.^{2,10,11} In disagreement, the present study shows only 5% of the individuals using the NGT. The predominant nutritional pathway in the present patients analyzed was oral ingestion (42.5%), followed by the NET (40.0%). This contrast may be justified by the medical routine of

each hospital unit, which elects the alternative pathway to be recommended in each case.

The NGT and the NET were the most prevalent feeding pathway, observed in 5% and 40% of the cases, respectively. The average time of use of these nutritional supports was 41.44 days. There is agreement between the authors that another important recommendation for gastrostomy is the long-term use of enteral nutrition.¹⁵ This period of time has

no consensus among the studies and may vary from 1 to 3 months, depending on the reference consulted.^{10,15}

In relation to the respiratory condition in the period before the gastrostomy insertion, almost half of the patients (45%) did not use any respiratory aid. Among the remaining patients, 27.5% were dependent on oxygen or ventilatory support, with an additional 22.5% patients needing invasive support. When analyzing the respiratory condition of the patients in the period between 1 and 6 months after the gastrostomy had been inserted, 27.5% of the patients were found ventilating in ambient air and 45% were depending on oxygen or ventilation support, of which 35% were invasive. It was also found that a great number of medical records ignored that information (27.5%), in the period before as well as in the period after the gastrostomy procedure.

It was not possible to find data in the literature related to the respiratory condition of patients who were recommended to have or had been submitted to a gastrostomy insertion. However, deficits in the respiratory conditions have been related to risk factors for dysphagia and as complications in the rehabilitation of patients with deglutition disorders.¹⁷⁻¹⁹

It is known that the coordination between respiration and deglutition is a primordial factor for the safe and efficacious transport of food via the digestive pathway. Thus it is possible to infer that the need for respiratory support may cause changes in the respiratory function and thereby increase the chance of difficulties in deglutition.²⁰ In theory, the greater the need for respiration aid, the greater the difficulty in the capacity to protect the airways, which brings more risk to the clinical presentation of the patient.

In 97.5% of the patients analyzed, nutrition was introduced via gastrostomy, while in 2.5% of the patients, this information had been ignored. The introduction of enteral feeding occurred an average of 2.82 days after the procedure was performed. This waiting period is part of the protocol used by the IPPMG, and it may differ depending on the medical facility.

The literature shows that, traditionally, the use of the gastrostomy is initiated 24 hours after its insertion,¹⁰ however, authors such as Srinivasan & Fisher²¹ concluded that the earlier the feeding begins, at around 3 hours after the insertion, the greater the efficacy and the lesser the time of hospitalization. There are different studies that agree with these authors on beginning the feeding earlier, although with more caution, recommending starting 3 to 6 hours after the procedure.²²

Table 8. Respiratory support

Respiratory support	N	(%)
Ambient air	11	(27.5%)
O ₂	4	(10%)
TCT	7	(17.5%)
TCT+MV	6	(15%)
OTT	1	(2.5%)
NIV	0	(0%)
Ignored	11	(27.5%)
Total	40	(100%)

O₂ – oxygen; TCT – tracheotomy; MV – mechanical ventilation; OTT – orotracheal tube; NIV – non-invasive ventilation.

When analyzing the evolution of the nutritional pathway of the patient after the insertion of the gastrostomy, it was observed that, although 17.5% of the gastrostomized patients returned to oral ingestion within 6 months of the procedure, most of them continued being fed exclusively through the gastrostomy (80%), which is fully justified by the gravity of the clinical presentations found in these patients. While investigating the return to oral ingestion, it was possible to observe that most patients were not being monitored by qualified professionals, but that a family member or caregiver was the person responsible for reintroducing the oral ingestion. This prevalence of exclusive enteral feeding is also found in studies that cite that the resumption of oral ingestion is only possible in a few cases, when monitored by the appropriate professionals.⁹

The reported rate of complications connected to the gastrostomy is generally low.²³ These complications may be divided into minor and major¹⁰ or whether or not in connection with the tube.²⁴ The minor complications occurred in 7% to 10% of the cases and are connected with: local skin infection-which is the most common complication,²⁵ obstruction of the tube, accidental removal of the tube, and secondary abdominal pain-mainly chemical peritonitis.¹⁰

Major complications are rare, occurring only in 1% to 2% of the cases. Among them there are: death, necrotizing fasciitis, aspiration pneumonia, severe bleeding, peritonitis, gastrocolic fistula, perforation, and tumor dissemination.¹⁰ The complications related to the tube are: migration, obstruction, fistula, tumor dissemination, paralytic ileus, and peritonism.²⁴ Those not related to the tube include local infections and gastroesophageal reflux.²⁴ Those that occur during the procedure are: perforation of the esophagus, hypoventilation stemming from sedation, and aspiration pneumonia.²⁴ In the present study, the rate of minor complications was only 22.5%, with inflammation as the most common (15%), and

2.5% for major complications, corresponding to only one case of hemorrhage. In addition, 27.5% of complications related to the tube were also observed, with 10% for migration, and 5% not related to the tube, referring to two cases of local infection. Therefore, the low rate of complications from the use of this way of feeding is evident.

Gastrostomy is a reversible procedure and the patient can return to feeding exclusively through oral ingestion. However, in this sample as well as in the literature, the number of patients who return to the safe and efficacious capacity of deglutition is small. This is explained mainly by the various adverse clinical conditions found within the patient himself, which initially led to this procedure being recommended. The removal of the gastrostomy tube with return to oral ingestion of food was seen in only 2.5% of the patients in the study and cited only in two of the studies found on the subject.^{9,12}

There are many studies discussing the techniques, ethical aspects, needs, and benefits of the gastrostomy. Nevertheless, there is a scarcity of studies discussing aspects specific to dysphagia, the possibility of removing the gastrostomy, and the contribution of the speech therapist as a professional responsible for the evaluation and rehabilitation of the deglutition function.

The speech therapist is the professional qualified to evaluate and diagnose the deglutition disorders, as well as to define conducts that seek to reintroduce oral ingestion safely and efficiently.¹⁵ Therefore, the inclusion of this professional in the multidisciplinary team can favor the rehabilitation of the patient with deglutition disorder and prevent the recommendation of a gastrostomy or even revert it, when possible. In severe cases, as seen in the study, the speech therapist should be part of the team that would orient the responsible party on the importance of a gastrostomy to this individual, explaining the risks of feeding through oral ingestion. Aside from that, this

will be the professional who would monitor the patient after surgery, in order to manage the saliva and search for a safe consistency to maintain the pleasure of food via oral ingestion.

The present study had a few limitations due to the number of participants and the retrospective analysis. Thus, future works should be long term prospective and longitudinal studies, with a larger sampling of subjects, in order to analyze the evolution of the patient after the insertion of a gastrostomy, the impact it has in his growth and development, its possible complications, and the effect of speech therapy intervention in the medium and long terms for those individuals.

CONCLUSION

The results obtained in the present study indicate that the profile of patients submitted to the insertion of a gastrostomy is mostly of male individuals with neurological and respiratory diseases, with no need for respiratory support, feeding exclusively via oral ingestion or nasoenteric tube for a prolonged period of time, and with an average age of 3.86 years. The most frequent diseases and underlying conditions were encephalopathy, pneumonia, seizures, and malnutrition.

The main criteria for the recommendation of a gastrostomy were neurological disease and dysphagia. In relation to the outcome of the gastrostomy insertion, most patients were successful in introducing the nutrition in that way, an average of 2.82 days after the insertion, with the most frequent complications being the extravasation of gastric material and inflammations in the gastrostomy area. In addition, most participants in the present study remained feeding exclusively through the gastrostomy for up to 6 months after the procedure.

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