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Management of Gastrostomy Sites in Institutionalised Children with Severe Neurological Impairment

KM CHEUNG, CH LO, PWT TSE, KH CHAN

Abstract

Stoma complications were common in developmental delayed children on gastrostomy feeding. Fifty-one children were on gastrostomy feeding in the Development Disabilities Unit in Caritas Medical Centre. In 2001, 8.3% had stoma erosions and 25% had granuloma and 33% had inflammations around the stoma. After the pilot of a monitor program for gastrostomy care to all the caretakers, 13.9% of patients had stoma erosions, 30% had stoma granuloma and 2.3% had inflamed stoma. The frequency of stoma complications decreased further (6.9% had stoma erosions, 6.9% had stoma granuloma and 9.3% had inflamed stoma) seven months after the program had been carried out. Our results suggested that local complications of gastrostomy stoma can be reduced by providing education to the caretakers together with frequent monitor.

Key words

Complications; Gastrostomy; Neurological impairment; Stoma

Introduction

Gastrostomy feeding was now commonly used in children with neurological impairment when oral feeding was not feasible. It could circumvent many unwanted complications of nasogastric feeding, such as nasal trauma and otitis media. Although it was generally considered to be more cosmetically acceptable, local stoma complications such as stoma infection and granulation tissue overgrowth was common.¹⁻³ Pressure ulcers induced by the retaining devices also occurred frequently.³ Recently, the limitations

and complications of gastrostomy feeding had been studied and reviewed,¹⁻⁵ but only little information was available on the prevalence of stoma complications and management of the gastrostomy stoma.

Development Disabilities Unit in Caritas Medical Centre was the largest residential hospital for children with severe neurological impairment in Hong Kong. Gastrostomy feeding had been promoted in recent few years. Before 2000, only ten children were on gastrostomy feeding. At June 2003, fifty-one children had been on gastrostomy feeding. Half of them had the gastrostomy procedure performed in our hospital. Over these years, the stoma complications were common. A prospective study was started since mid-2001 to investigate the frequency of stoma complications and the effect of a monitor program in reducing the frequency of stoma complications.

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Received August 12, 2005

Method

From the August of 2001, all the patients on gastrostomy feeding were included and were followed prospectively. The baseline conditions of all stomas were recorded by photographs and by clinical notes. Guideline for gastrostomy care and management of gastrostomy complications was set up. In short, the caretakers had to

cleanse the stoma everyday with soap and water during the shower for the children. The feeding tube should be rotated 45 degree clockwise before every feedings. The position of the retaining device on the stoma exit site should be noted everyday in order to prevent the inward and outward migration of the feeding tube. Once local stoma complications occurred, appropriate therapy should be applied according to the guideline (Appendix 1). A physician recorded all the stoma condition periodically (every 3 months). Recommendations for treatment of complications and use of gastrostomy device were made on every visit. A registered nurse was responsible to hold workshops of gastrostomy care for all nursing staff. These two investigators studied the stoma condition of all patients with gastrostomy in November of 2002. A scoring system was used to document the stoma condition by the investigators independently. For the ulcer scores, grade 1 was normal skin, grade 2 was erosion and grade 3 was ulcer. For the granuloma scores, grade 1 was no granuloma, grade 2 was granuloma of diameter <5 mm and affected <50% of the stoma, and grade 3 was granuloma of diameter >5 mm and affected >50% of the stoma. For the inflammation score, grade 1 was normal skin, grade 2 was mild peri-stoma inflammation and grade 3 was intense inflammation with or without discharge. Kappa statistics were calculated to verify the inter-rater reliability of the scoring system. The kappa score was 0.78 for the ulcer scores, 1 for the granuloma score and 0.65 for the inflammation score. The baseline score of the stoma condition was obtained retrospectively by reviewing the photograph and case notes. Patients with paired scores (i.e. both pre and post intervention stoma scores) were included to study whether this program was associated with significant improvement of stoma scores.

From November 2002 onwards, the registered nurse monitored all the stoma by using the scoring system. All the stomas were reviewed monthly and recommendation such as treatment for the complications, change of gastrostomy device was made in each visit.

The scores of the stoma condition at November 2002 used as baseline. After the implementation of the monitor system the two investigators scored the stoma independently. The scores of the stoma condition in June 2003 were compared to the scores at November 2002. Again, only patients with paired scores would be included in the statistical analysis to determine whether the monitor program was associated with significant changes in stoma scores.

Statistics

Kappa statistic was calculated to verify the inter-rater reliability of the scoring system. Wicosen signed ranks test was used to study the effect of the education programme and the monitor program.

Results

Fifty-one children (28 boys and 23 girls) had been on gastrostomy feeding. Median age was 9.31 (2.69-22.08) years. Four patients had been discharged and four patients died during the follow up period.

Frequency of Stoma Complications (Figure 1)

In 2001, twenty children in DDU were on gastrostomy feeding. Two patients (8.3%) had stoma erosions and six patients (25%) had granuloma of <5 mm in diameter. Eight patients (33%) had inflammations around the stoma and three (12.5%) of them required systemic antibiotics.

In 2002 after the pilot monitor program was conducted, the number of patients with gastrostomy increased to forty-three because some new patients had gastrostomy and percutaneous endoscopic gastrostomy was performed in some of the residents. Six patients (13.9%) had stoma erosions. Thirteen patients (30%) had stoma granuloma and three of them had granuloma of size >5 mm in diameter. One patient (2.3%) had inflamed stoma.

In 2003, forty-four children were on gastrostomy feeding. One was inaccessible because he was at home leave during the assessment. Forty-three stomas were reviewed. Three (6.9%) had stoma erosions. Three (6.9%) had stoma granuloma and one of them had granuloma of size >5 mm in diameter. Four (9.3%) had inflamed stoma.

Effect of the Monitor Program (Tables 1 and 2)

A cohort of nineteen patients was followed from 2001 to 2002. At baseline, 36.8% of patients had stoma inflammation and only 3.3% of patients had stoma inflammation after the intervention ($P<0.05$) but there was no change in the frequency of stoma ulcer (15.8% at baseline and 10.5% after intervention) and the frequency of granuloma (26.3% at baseline and 26.3% after intervention).

A cohort of thirty-eight patients was followed from 2002 to 2003, there was significant reduction in stoma granuloma from 34.2% to 7.9% ($P<0.05$). There was no significant difference in the frequency of stoma ulcer (13.2% vs 5.3%) and the frequency of stoma inflammation (2.6% vs 5.3%).

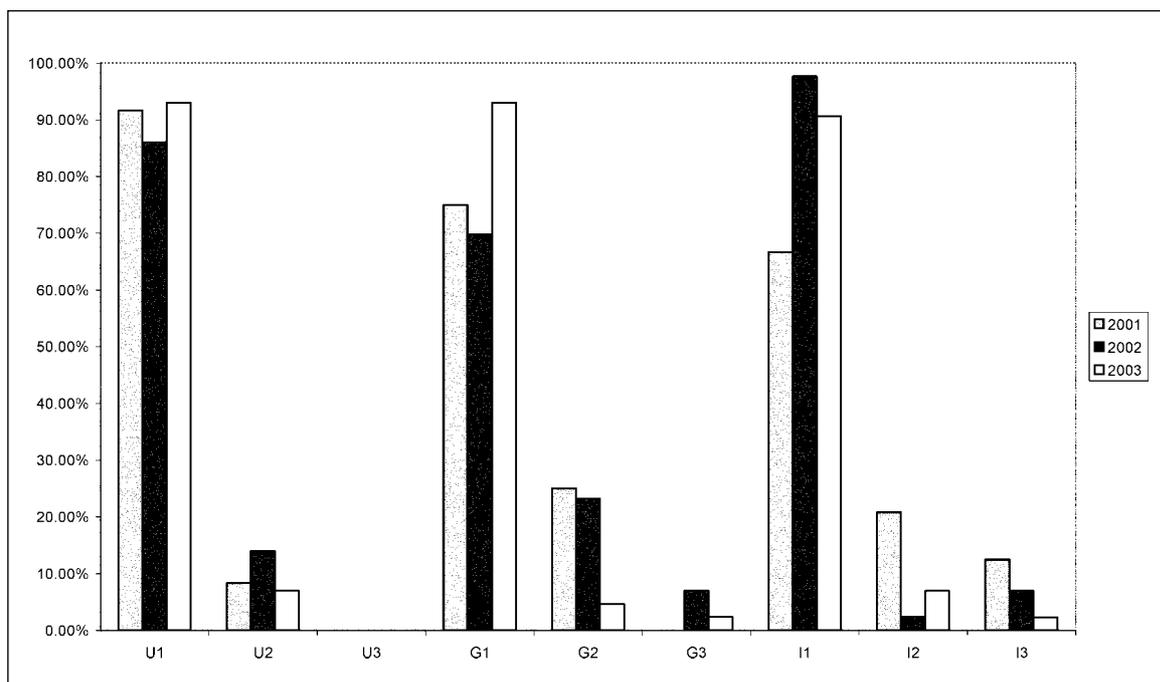


Figure 1 Stoma scores from 2001-2003.

Table 1 Stoma score of the cohort of 19 patients from 2001 to 2002

Score	Ulcer		Granuloma		Inflammation*	
	2001	2002	2001	2002	2001	2002
1	16 (84.2%)	17 (89.5%)	14 (73.7%)	14 (73.7%)	12 (63.2%)	18 (94.7%)
2	2 (10.5%)	2 (10.5%)	4 (21.11%)	5 (26.3%)	4 (21.0%)	1 (3.3%)
3	1 (5.3%)	0 (0%)	1 (5.3%)	0 (0%)	3 (15.8%)	0 (0%)

*Wicoson sign rank test: P<0.05

Table 2 Stoma score of the cohort of 38 patients from 2002 to 2003

Score	Ulcer		Granuloma		Inflammation*	
	2002	2003	2002	2003	2002	2003
1	33 (86.8%)	36 (94.7%)	25 (65.5%)	35 (92.1%)	37 (97.4%)	36 (94.7%)
2	5 (13.2%)	2 (5.3%)	10 (26.3%)	2 (5.3%)	1 (2.6%)	2 (5.3%)
3	0 (0%)	0 (0%)	3 (7.9%)	1 (2.6%)	0 (0%)	0 (0%)

*Wicoson signed ranks test: P<0.05

Discussions

Our results showed that the gastrostomy care had been improving in the unit throughout these three years. Before intervention, stoma complications were very common in our patients. The results of the pilot study suggested that the program was effective in reducing stoma inflammation

but the frequency of stoma granuloma was still very high (30%). After this "run-in" period, the stoma complications were remarkably reduced. This would be explained by the better adherence to caring regimen because of the frequent monitor and the acquisition of experience of stoma care in the nursing staff.

Stoma complications had been reported to be about 32%

in patients with psychomotor retardation.² In our group of patients, we found that the complication rate was comparable. Our patients had profound mental retardation and their activity of daily life was totally dependent. They relied on the caretakers to adhere to the stoma care protocol to cleanse the stoma, rotate the tube and monitor the position of the retaining device on the stoma exit site. These procedures were important as cutaneous breakdown occurred when the retaining device exerted excessive pressure on the skin. This caused widening of the stoma and resulted in leakage of gastric juice. Frequent migration of feeding tubes, recurrent leakage and stoma infections were the precipitating factors of the granulomatous overgrowth. All these factors were preventable provided the routine gastrostomy care was proper. Stoma leakage was encountered in two patients during this study period and it resolved after adequate stoma care and antibiotics treatment of wound infection.

Adherence of the caring regimen can also prevent more serious complications such as tube migration and dislodgement. Inappropriate traction of the gastrostomy tube due to failure of checking of the tube position will predispose buried bumper syndrome (i.e. migration of internal bumper of gastrostomy tube into abdominal wall).^{1,6} Excessive traction would cause tube dislodgement. One patient had dislodgement of PEG tubes during the study period. Intestinal obstruction had been reported in patients with

gastrostomy if the internal bumper migrated into small intestine,¹ all these complications were preventable provided patient had appropriate care. Our results showed that education and frequent monitor was required in the care of gastrostomy stoma of institutionalised children with severe neurological impairment.

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Appendix 1 Grading System and Management			
Severity	Grade 1	Grade 2	Grade 3
Problems			
Ulceration	No ulceration, intact and healthy skin	Mild skin erosion: skin break around gastrostomy site.	Ulceration: skin break with definite ulcer crater around gastrostomy
Management of Ulceration	Routine care, not require any treatment	Routine care, keep surrounding skin clean and dry	Daily N/S dressing until ulcer heal, keep surrounding skin clean and dry
Granuloma	No granuloma	Small granuloma: size <0.5 cm and area involved less than 50% of the stoma	Large granuloma: size >0.5 cm and area involved more than 50% of the stoma
Management of Granuloma	Routine care, not require any treatment	√ Consult doctor for prescription of Kenacomb for 2 weeks √ Cauterization if no improvement after 2 weeks	√ Consult doctor for prescription of silver nitrate √ Followed by Kenacomb for 2 weeks to prevent recurrence
Inflammation	No inflammation	Presence of inflammation requiring local treatment	Presence of inflammation / infection requiring systemic antibiotics
Management of Inflammation	Routine care, not require any treatment	Consult doctor for prescription local treatment	Consult doctor for prescription of systemic antibiotics