

# Recovery of oral feeding in Japanese elderly people after long-term tube feeding: A challenge in Miyama Hospital

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## ABSTRACT

**Context:** In Japan, many patients who cannot consume food orally are managed using external tube feeding over long periods. Although helpful in nutritional management, tube feeding significantly reduces a patient's quality of life. **Aims:** We examined the factors that affected the transition from tube to oral feeding in elderly people. **Settings and Design:** Single-center, retrospective, pilot study conducted from January 1, 2018 to December 28, 2019. **Methods and Materials:** We recruited patients who attempted to return to oral intake following tube feeding for >12 months at Miyama Hospital. Fourteen participants (male-to-female ratio = 6:8; age = 83.9 ± 2.6 years) attempted to resume oral feeding. We investigated patient diagnoses, duration of tube feeding, sex, swallowing reflex time, and Kohnan consciousness score. Patients with a swallowing reflex >4 s were administered banxia houpu tang. **Results:** Of the 14 patients, seven managed to resume oral feeding (group 1), while the remaining seven failed (group 2). The two groups of patients showed no significant difference in terms of mean age, duration of tube feeding, swallowing reflex time, and sex. However, the consciousness level of group 1 was significantly higher than that of group 2. **Conclusions:** Higher consciousness level in patients who successfully resumed oral feeding suggests that oral feeding should be considered in patients with adequate consciousness.

**Keywords:** Banxia houpu tang, Kohnan score, nasogastric tube, oral feeding, percutaneous endoscopic gastrostomy

## Introduction

In Japan, which is experiencing unprecedented aging on a global scale,<sup>[1]</sup> many patients who cannot consume food orally are managed for extensive periods using tube feeding after a stroke or loss of appetite. The two most commonly used methods are nasogastric tube (NGT) feeding and percutaneous endoscopic gastrostomy (PEG).<sup>[2]</sup> Although tube feeding helps in nutritional management, it causes distress and inconvenience to patients, especially elderly people with dementia, thereby significantly reducing their quality of life.<sup>[3-5]</sup> Tube feeding is also associated with risk factors for aspiration pneumonia.<sup>[6]</sup> Therefore, using

medical records, we conducted this retrospective study of factors affecting the recovery of voluntary oral feeding in elderly patients.

## Subjects and Methods

In this retrospective study, we used medical records of patients who attempted to resume oral feeding after receiving NGT or PEG treatment at Miyama Hospital for at least 12 months. Miyama hospital is a medical long-term care sanatorium located in Ohshu City, Japan, where patients are hospitalized for months or even years. We extracted data on patient's sex, age, duration of NGT or PEG use, swallowing reflex time (s),<sup>[7]</sup> reasons for failure, and consciousness levels (Kohnan score) from their medical records.<sup>[8]</sup> For patients in whom the swallowing reflex took longer than 4 s, banxia houpu tang (BHT), a specific

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type of traditional Chinese medicine reported to improve the swallowing reflex and reduce the risk of developing aspiration pneumonia, was administered.<sup>[7,9,10]</sup> We also collected data on their swallowing reflex time at baseline and after BHT treatment. We compared the group of patients who managed to recover to oral feeding (group 1) versus those who failed to resume this type of feeding (group 2). A speech-hearing therapist evaluated the swallowing function of all patients and attempted to train them using a method previously reported.<sup>[11]</sup> The study design was approved by the Miyama Hospital Ethics Committee (Clinical MIYAMA-RINRI2019-8), and it conforms to The Code of Ethics of the Declaration of Helsinki and its later amendments. No patient identifiers were used, and all data were anonymized. We report our findings according to the STROBE guidelines for observational studies.<sup>[12]</sup>

### Statistical analysis

The Wilcoxon rank-sum test was used to compare the two groups in terms of age, tube feeding duration, and swallowing reflex time. The Student's t-test was performed to compare the Kohnan score of group 1 with that of group 2. A paired t-test was used to compare swallowing reflex time before BHT therapy with that after the therapy. A *P* value <0.05 was considered statistically significant. Statistical analysis was performed using the JMP Pro15 software (SAS Institute, Tokyo, Japan).

### Results

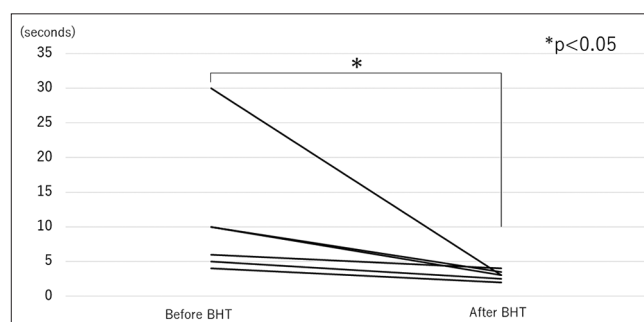
It is evident from Table 1 that 50% of all patients successfully resumed oral feeding after ≥12 months of tube feeding and subsequently had an improved quality of life. Three patients who used NGT were physically restrained to prevent them from pulling their tubes. When they resumed oral feeding, they no longer experienced this inconvenience and discomfort. In six patients treated with BHT, the swallowing reflex time improved

from 10.8 s to 4.0 s [Figure 1]. However, there was no significant difference in swallowing reflex time, mean age, sex, and duration of NGT or PEG treatment between the two groups.

According to Figure 2, the Kohnan score of patients in group 1 was significantly lower than that in group 2 ( $30.0 \pm 5.9$  vs  $48.6 \pm 4.5$ ), which indicates that group 1 had a higher level of consciousness. Reasons for failure to resume oral feeding included low consciousness (four patients), refusal (two patients), and tongue dystonia (one patient).

### Discussion

In the present study, our main finding was that half of the patients (7/14) managed to resume oral feeding after long-term NGT or PEG use. Generally, elderly patients with long-term enteral feeding through NGT or PEG need permanent tube feeding. We found only one previous report on the resumption of oral feeding after long-term tube feeding.<sup>[3]</sup> A previous study concluded that BHT significantly improved swallowing reflex.<sup>[6]</sup> However, no significant difference in the swallowing

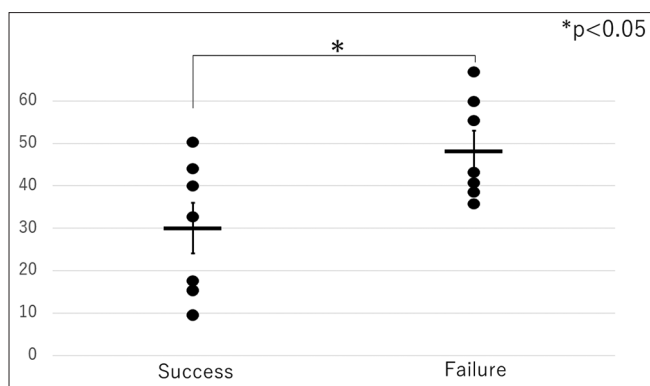


**Figure 1:** Changes in swallowing reflex time before and after banxia houpu tang administration in seven patients who received tube feeding. Thick solid line indicates individual patients

**Table 1: Patient characteristics and data on feeding status**

Age	Sex	Diagnosis	Duration of *NGT (months)	No.	†BHT use	Swallowing reflex before BHT (s)	Swallowing reflex after BHT (s)	Kohnan Score	Oral feeding	Reason for failure	
1	81	Female	Cerebral infarction	24	NGT	Yes	4.0	2.0	44	Success	
2	96	Female	Chronic heart failure	24	NGT	Yes	10.0	3.5	18	Success	
3	88	Male	Cerebral infarction	60	PEG	No	3.5		15	Success	
4	66	Male	Lung cancer	24	NGT	No	2.5		10	Success	
5	88	Female	Chronic heart failure	24	NGT	No	Not tested		50	Success	
6	84	Female	Alzheimer's disease	24	PEG	No		3.0	40	Success	
7	71	Male	Pons atrophy	36	NGT	Yes	10.0	3.0	33	Success	
8	89	Male	Cerebral infarction	12	NGT	Yes	Not tested		39	Failure	Low consciousness
9	91	Female	Cerebral infarction	48	NGT	Yes	30.0	3.0	56	Failure	Tongue dystonia
10	75	Male	Parkinson's disease	60	NGT	Yes	5.0	2.5	36	Failure	Low consciousness
11	94	Female	Alzheimer's disease	48	NGT	No		2.9	43	Failure	Low consciousness
12	83	Male	Cerebral infarction	48	NGT	No		2.3	66	Failure	Low consciousness
13	96	Female	Alzheimer's disease	26	PEG	No		2.0	40	Failure	Denial
14	73	Female	Cerebral bleeding	24	PEG	Yes	6.0	4.0	60	Failure	

\* NGT=nasogastric tube, PEG=percutaneous endoscopic gastrostomy, †BHT=Banxia houpu tang



**Figure 2:** Comparison of the Kohnan scores between group 1 (success) and group 2 (failure). Black circles represent individual patients, horizontal black lines illustrate the average of each group, and vertical line depicts the standard error of each group

reflex was observed between the two groups in our study. The level of consciousness among patients in group 1 was significantly better than that of those in group 2. In fact, the most common reason for the failure to resume oral feeding was low consciousness. Some patients who used tube feeding were physically restrained because they were attempting to pull out their tubes. In the present study, three patients were relieved of their restraints after they resumed oral feeding, which indicates how oral feeding resumption can improve quality of life. In Japan, primary care physicians are in charge of tube feeding elderly patients who receive both home care and institutional care. Improving the quality of life of elderly people who are managed by tube feeding is an important issue for primary care physicians. In recent years, a Taiwanese research team reported that for older patients with dementia requiring in-home health care, NGT feeding is not associated with a significantly lower risk of pneumonia than assisted hand feeding. Additionally, neither mortality nor hospitalization rates decreased with NGT feeding.<sup>[13]</sup> We also believe that tube feeding does not reduce the incidence of pneumonia, hospitalization, or mortality and can significantly reduce the quality of life of elderly patients. Our findings suggest that adequately conscious patients are more likely to discontinue tube feeding and resume oral intake. Primary care physicians should therefore actively attempt to stop tube feeding and resume oral intake in adequately conscious patients.

However, this study has limitations that need to be addressed. First, it was a pilot study with a retrospective design conducted at a single center. Second, our study included only a very small number of patients. The health conditions of patients, feeding skills of caregivers, and the form of food used for ingestion may have varied across health facilities. All of these factors would affect the generalization of the study results to other populations. Therefore, it is necessary to conduct prospective studies with larger sample sizes to collect relevant data on the recovery from tube feeding to oral intake. Finally, studies should also be conducted on the prognosis and quality of life.

## Conclusion

Higher consciousness level in patients who successfully resumed oral feeding suggests that oral feeding should be considered in patients with good consciousness.

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## Conflicts of interest

Tatsuya Nogami received lecture fees from Tsumura & Co., Ltd. In addition, Department of Japanese Oriental Medicine, Graduate School of Medicine and Pharmaceutical Sciences, University of Toyama, to which he belonged, and Department of Kampo Medicine, Tokai University School of Medicine, to which he currently belongs, received research grants from Tsumura & Co., Ltd. However, it is not related to this study.

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