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Original Article

Effect of lollipop sucking on the recovery of gastrointestinal function in children after congenital choledochal cyst excision: A randomized controlled trial



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ABSTRACT

This study is aimed to evaluate the effect of lollipop sucking on the recovery of gastrointestinal function in children after congenital choledochal cyst excision. 58 children who had undergone congenital choledochal cyst excision were randomly divided into two groups: the controlled group and the experimental group. Children in the experimental group were allowed to suck on strawberry lollipops for 20–30 min once every four hours beginning six hours after the operation. The recovery time of bowel sounds and anal defecation was recorded and compared between experimental and control groups. Compared with the controlled group the recovery times of bowel sounds (41.75 ± 7.38 h vs. 51.43 ± 5.02 ; $p < 0.001$) and anal defecation (64.32 ± 14.69 h vs. 79.17 ± 14.91 h; $p < 0.001$) were significantly shorter in the experimental group. Results of the present study indicate that Sucking of lollipops by children after choledochal cyst excision facilitates the recovery of bowel movement and relieves postoperative abdominal distension.

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1. Introduction

Congenital choledochal cysts, or congenital dilation of the common bile duct, are a common diagnosis in infants and children. Patients typically complain of abdominal pain and present with jaundice and an abdominal mass. As the

condition can potentially progress to severe, life-threatening complications, such as pyogenic cholangitis, pancreatitis, perforation of the bile duct and cirrhosis, surgery should be performed upon diagnosis [1]. However, the operative wound and anaesthesia result in a weakened or absent gastrointestinal motility, which is associated with nausea, vomiting and abdominal distension [2], which can also affect

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respiration and incision healing [3]. Therefore, hastening the postoperative recovery of bowel sounds, restoration of diet, and reduction of postoperative complications are linked to the patient's recovery.

A recent study demonstrated that gum chewing enhances bowel function recovery after abdominal operation [4]. However, gum chewing is not a feasible option for infants and young children. Therefore, the efficacy of lollipop sucking on gastrointestinal recovery was evaluated in paediatric patients who had undergone resection surgery for congenital choledochal cysts. Specifically, recovery was assessed as the time to return of bowel sounds and defecation.

2. Materials and methods

2.1. Subjects

Patients hospitalized between January 2011 and June 2014 for congenital choledochal cyst excision or hepatic duct and jejunum Roux-en-Y anastomosis in the Second Hospital of Lanzhou University were recruited for this study. Criteria for inclusion were: <14 years of age; choledochal cyst excision or hepatic duct and jejunum Roux-en-Y anastomosis for a confirmed diagnosis of type I choledochal cyst; voluntary participation. Patients were excluded from the study if they had a history of abdominal surgery, preoperative cyst rupture, haemorrhage, cholangitis, postoperative concurrent intestinal fistula, biliary fistula and reoperation, or congenital diabetes, or if they showed poor adherence to sucking lollipops (<20 min each time, or <3 lollipops/d). This study was approved by the hospital ethics committee.

2.2. Experimental design

The experiment was a randomized controlled trial where the patients were given a random code for group assignment (experimental or control) that was generated by a random number table. Specifically, the randomization scheme is hidden, and the code is sealed in a non-transparent envelope and managed by a person who is not participating in the research. Due to the nature of the treatment, blinding was not possible. However, the children in each group were placed in different wards to prevent patient interaction.

Patients were given routine nursing care; passive or active body activity was permitted 6 h after the operation upon awaking from anaesthesia, and out-of-bed activity was permitted on the second postoperative day if their condition allowed. Patients in the experimental group were instructed to suck on a strawberry lollipop for 20–30 min every 4 h beginning 6 h after the operation. This was equivalent to approximately three lollipops each day until they were able to begin eating again.

2.3. Sample size calculation

According to the equation $n = 2 \times [(Z\alpha + Z\beta) \times \delta/d]^2$, the experimental and control groups were allocated at 1:1; $Z\alpha$ is 1.96 and $Z\beta$ is 1.64. Assuming that lollipop sucking would

reduce the bowel sound recovery time <9 h, $d = 9$ and $\delta = 6$ when 29 cases are included in each group.

2.4. Evaluation of gastrointestinal function by nursing staff

The recovery time of bowel sounds was assessed every two hours by abdominal auscultations (3 min each time); three or more bowel sounds per minute indicated recovery of intestinal peristalsis. The time of the first stool passage after the surgery was recorded as the anal defecation time.

2.5. Statistical analysis

Data were analysed using Student's t tests, analyses of variance, and correlational and multiple regression analyses using SPSS version 17.0 software (SPSS Inc., Chicago, IL, USA). Data are expressed as mean \pm SD. A p value of <0.05 was considered statistically significant.

3. Results

A total of 61 participants were recruited for this study; two children did not meet the inclusion criteria, and only one child was excluded from the experimental group because of poor sucking adherence. Therefore, 58 patients were included in the analyses (experimental group, $n = 29$; control group, $n = 29$). Baseline characteristics did not differ between the two groups (Table 1).

Bowel sounds recovered significantly faster in patients from the experimental group compared with the control group (41.75 ± 7.38 h vs. 51.43 ± 5.02 h; $t = 6.318$, $p < 0.001$). In addition, anal defecation occurred significantly sooner in the experimental group compared to the controls (64.32 ± 14.69 h vs. 79.17 ± 14.91 h; $t = 4.138$, $p < 0.001$). None of the patients in the experimental group crushed or crunched the lollipops, and there were no cases of coughing, vomiting or other adverse events. There were no postoperative complications in any of the patients, such as postoperative haemorrhage, anastomotic leakage, or wound infection or dehiscence.

4. Discussion

4.1. Lollipop sucking after congenital choledochal cyst excision

Gastrointestinal dysfunction after abdominal surgery is a common postoperative complication. Moreover, waiting for recovery of intestinal function in these patients is often prolonged and results in an increase in the patient's pain [5]. Because of this, the clinical use of enemas, anal exhaustion and point injection are promoted. However, as with gum chewing, these methods are not feasible, and can be traumatic, in young children and infants. The results of the current study show that bowel sounds and defecation recovered sooner in children who were allowed to suck on lollipops. Although the consumption of sweets was traditionally

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