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Incomplete stomach emptying as a complication of intragastric balloon treatment and a solution suggestion: Pineapple juice drinking

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Background/aims: *During removal of intragastric balloon, there is a great deal of gastric undigested food even after an eight-hour starvation. Bromelain, a proteolytic enzyme existing in the pineapple juice seems to be a good choice for the undigested food remnants in the stomach. We aimed to investigate the effect of drinking pineapple juice on dissolving food remnants in patients undergoing endoscopic procedure for removal of intragastric balloon.* ***Materials and Method:*** *In this study, we included patients who had undergone endoscopic placement of intragastric balloon (BIB®, BioEnterics Intragastric Balloon, Inamed Health, CA, USA) between February 2009 and March 2012. First 8 patients were asked to fast the whole night before the procedure (at least 8 hours) and to apply clear liquid diet for 3 days before the endoscopic removal. A great amount of food remnants was seen in the stomach during the endoscopic balloon removal procedure. A second endoscopic procedure was planned 3 days later and, in order to decrease the food remnants, the patients were asked to drink 1 L pineapple juice per day. The next 11 patients were also advised to drink 1 liter per day of 100% pineapple juice for 3 days before the endoscopic removal.* ***Results:*** *Totally, 19 obese patients (17 female, 2 male) were included in the study. Mean age was 38,68±7,95 years, mean weigh was 124,23±19,30 kg, and mean body mass index was 49,73±9,22 kg/m^2. There was undigested food in the stomach during endoscopic removal in the first 8 patients. However, no undigested food in the stomach was found at the second endoscopic examination. In the other 11 patients, no food remnants were observed after taking pineapple juice prior to the endoscopic removal procedure.* ***Conclusion:*** *Drinking pineapple juice for 3 days before endoscopic balloon removal seems to be effective in dissolving food remnants in the stomach. Drinking pineapple juice may be recommended in all patients undergoing endoscopic procedure for removal of intragastric balloon.*

Key words: Morbid obesity, intragastric balloon removal, pineapple juice

İntragastrik balon tedavisinin bir komplikasyonu olarak boşalmamış mide ve önerilen çözüm: Ananas suyu

Giriş ve Amaç: *İntragastrik balonun çıkarılması sırasında, sekiz saatlik açlığa rağmen midede oldukça fazla sindirilmemiş gıda artıkları bulunmaktadır. Ananas suyunda, sindirilmemiş gıdalar üzerine etkili olduğu bilinen bromelain adı verilen proteolitik bir enzim bulunur. Bu çalışmanın amacı, intragastrik balon çıkarılması esnasında karşılaşılan sindirilmemiş gıdalar üzerine ananas suyunun etkisini araştırmaktır.* ***Gereç ve Yöntem:*** *Şubat 2009 ve Mart 2012 tarihleri arasında intragastrik balon tedavisi uygulanan hastalar çalışmaya dahil edildi. Rutin sekiz saatlik açlık ve üç günlük sıvı diyete rağmen ilk 8 hastada, midede oldukça fazla katı gıda gözlendi ve bu hastalara endoskopiden üç gün önce ananas suyu (günde 1 Lt) içmeleri önerilerek ikinci endoskopi yapıldığında midede hiç gıda izlenmedi. Sonraki 11 hastaya direkt olarak mide balonu çıkarma işleminden üç gün önce ananas suyu içmeleri söylendi ve mide tamamen boş iken intragastrik balon çıkarıldı.* ***Bulgular:*** *19 obez hasta (17 kadın, 2 erkek) çalışmaya dahil edildi. Ortalama yaş 38,68±7,95, ortalama kilo 124,23±19,30, ortalama vücut kitle indeksi 49,73±9,22 kg/m^2 idi. İntragastrik balon çıkarılması esnasında ilk 8 hastada midede sindirilmemiş gıdalar izlendi, bu hastaların ananas suyu içtikten sonra yapılan ikinci endoskopilerinde ve sonraki 11 hastada midede hiç katı gıda yoktu.* ***Sonuç:*** *İntragastrik balon çıkarılırken tüm hastalara üç gün öncesinden ananas suyu içmeleri önerilir. Endoskopik balon çıkarma işleminden 3 gün evvel ananas suyu içilmesi midedeki sindirilmemiş gıdalar üzerine etkili görünmektedir.*

Anahtar kelimeler: Morbid obezite, intragastrik balon çıkarılması, ananas suyu

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INTRODUCTION

Obesity, one of the most important health problems all over the world, is usually related with some co-morbid diseases. Hypertension, diabetes mellitus, acute heart attack due to hyperlipidemia, stroke, and sudden death, the main problems of obese patients, were shown to be prevented or controlled with weight loss (1). Some life style modifications including strict diets, exercises, or medications have permanent affects, with the ending of the treatment; patients gain their weights back in a short time. Anti-obesity drugs, a pharmacological alternative for obesity, are long-lasting and have some limitations based on their systemic effects (2). Besides its serious side effects and irreversibility, bariatric surgery seems to be the best weight loss option at present (3,4). Endoscopic intragastric balloon placement was suitable for these morbid obese patients with its lower procedure risk compared to bariatric surgery (5).

The fluid-inflated intragastric balloon preferred in our center, is the most commonly used one (6). Perforation of intragastric balloon is also easily recognizable with the containing of methylene blue into the saline solution filling the intragastric balloon.

During endoscopic removal of intragastric balloon, we realize that almost all of our patients regardless of their success of weight loss, presented with a large amount of undigested food in the stomach even after an 8-hour starvation period. Even though we have not faced any serious complications in removing the intragastric balloon, the presence of some undigested food in the stomach in a lying patients makes physicians anxious.

Pineapple juice including bromelain, a proteolytic enzyme, seems to be a good choice in dissolving food remnants in the stomach (7). We showed the success of its' drinking alone in a diabetic patient admitted to our clinic with gastroparesis-related symptoms (8). Moreover, we published the efficiency of pineapple juice drinking in a gastrectomized patient who presented with phytobezoar-induced small bowel obstruction (9).

We designed this study, in order to evaluate the impact of pineapple juice drinking alone on dissolving undigested food in the stomach in patients undergoing endoscopic procedure for removal of intragastric balloon.

MATERIALS and METHOD

This single-center study was conducted on 19 consecutive morbid obese patients who had undergone endoscopic placement of intragastric balloon (BIB®, BioEnterics Intragastric Balloon, Inamed Health, CA, USA) between February 2009 and March 2012. Informed consent was taken from each of the patients before the procedure. All endoscopic examinations were performed under conscious sedation with midazolam in the Endoscopy Unit of Dıskapı Yıldırım Beyazıt Education and Research Hospital, Gastroenterology Clinic. The initial upper gastrointestinal (GI) endoscopy was routinely done to the patients to check for the presence of possible underlying disorders contraindicated for intragastric balloon placement. Firstly, the collapsed balloon was inserted with the help of special sheath, than the intragastric balloon was filled up by sterile saline (650 ml) containing methylene blue (10 ml) with the direct vision of endoscope (Fujinon EG 450 WL 5). All patients were hospitalized for the next four hours, and were given intravenous saline, proton-pump inhibitor, anti-emetic and anti-spasmotic agents. All patients were recommended to follow some dietary and behavioral restrictions. 1000 kcal diet, oral multivitamin supplements, and proton-pump inhibitors were prescribed to each one. The endoscopic procedure was performed in our Endoscopy Unit under the conditions mentioned above. At the end, to check for the possible hazardous affects of the intragastric balloon, upper GI endoscopy was also done. Endoscopic examinations, as well as the placement and removal of the intragastric balloon were all performed by the same endoscopist (Şimşek Z.).

To evaluate the efficiency of pineapple juice in dissolving undigested food observed during the endoscopic removal of intragastric balloon, the first eight patients were asked to follow clear liquid diet for 3 days before the procedure and to fast the whole night (at least 8 hours) before it. Additionally, the next 11 patients were also requested to drink 1 L of 100% pineapple juice in the evenings for 3 days before the procedure and to fast the whole night before it. The presence of food remnants and possible complications attributed to it were all recorded.

RESULTS

This one-center study was conducted on 19 consecutive obese patients (17 females (89,47%), 2 male (5,26%); mean age 38,68±7,95 (range: 21–53) years; mean weight 124,23±19,30 kg; mean body

mas index (BMI) 49,73±9,22 kg/m^2) who had undergone the BIB procedure between February 2009 and March 2011.

The first 8 patients (patients 1-8) presented with a large amount of food remnants in the stomach and were asked to follow clear liquid diet for 3 days before the endoscopic procedures and to fast overnight (Figure 1). To decrease the intra-procedure complications, the patients were called for a second endoscopic procedure. These first 8 patients were requested to drink pineapple juice (1 L per day) for the next 3 days till the second endoscopy, which showed empty stomach (Figure 2). Based on this experience, the next 11 patients (patients 9-19) were asked to drink pineapple juice for 3 days before the endoscopic removal directly. Therefore, a second endoscopic procedure was not necessary in the next 11 patients. All patients who consumed pineapple juice and underwent endoscopic examination for the removal of intragastric balloon were free of undigested food remnants in the stomach.

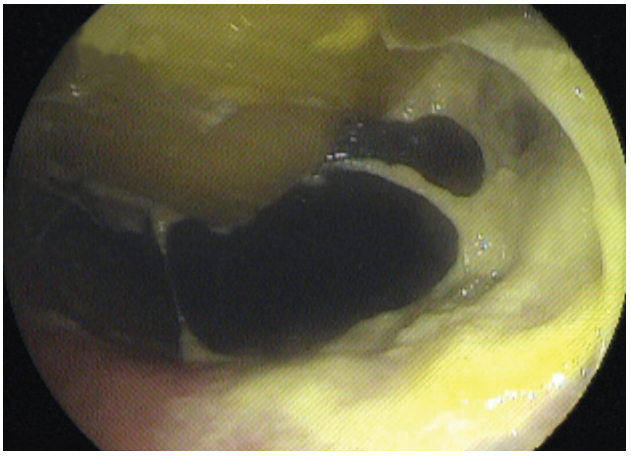


Figure 1. The undigested remnant food in stomach despite only watery diet and starving whole overnight.

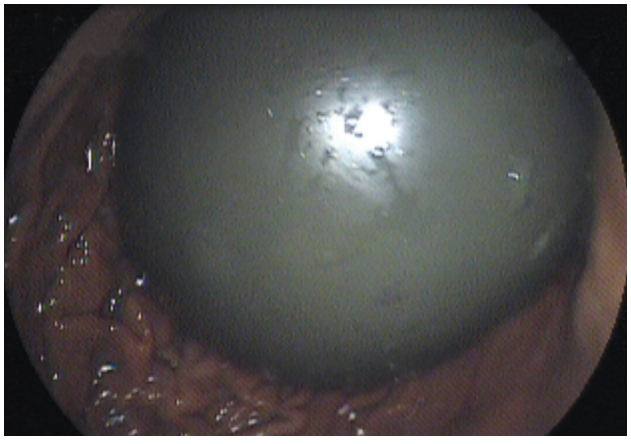


Figure 2. The upper endoscopy showing empty stomach after taking three days of pineapple juice.

DISCUSSION

Intragastric balloon is an effective and approved way for weight loss in morbid obese patients with or without any serious co-morbid diseases (6). With low complication rate and high tolerability, its usage has been growing all over the world. According to our previous experience in patients undergoing intragastric balloon placement, almost all of the patients presented with any amount of undissolved food in the stomach even after a starving period lasting the whole night. Although we had not experienced any serious complications attributed to the undigested food, the food remnants make us, the physicians performing the endoscopic procedure, anxious. Also, there is a huge lack about this topic in the English literature. The studies done about the intragastric balloon in obese patients have usually focused on the efficiency and safety of the procedure (4- 6, 10). Our study just focused on the usage of pineapple juice before intragastric balloon removal. Probably, due to lack of interest or awareness regarding this problem/situation, it has not been noticed or published. As a result, these are the first data about this unrecognized status.

Pineapple juice, which is known to have proteolytic effect, seems to be preferred much more in the upcoming years (7- 9). We have showed the efficiency of pineapple juice drinking alone in dissolving not only undigested food, but also phytobezoar formation, and not faced any serious complications attributed to the usage of pineapple juice, like hyperglycemia in diabetic patient, thus, we recommend pineapple juice drinking in such kind of situations (8, 9).

In conclusion, this was a single-center study on small number morbid obese patients who had undergone BIB insertion for the treatment of obesity. However, the result of this study, despite its limitation, showed that drinking pineapple juice for 3 days before endoscopic balloon removal is effective in undissolving food remnants in the stomach.

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