

**Chewing Gum: A Funny Way Opposed To Postoperative Ileus For Gynecological Operations****Jinekolojik Operasyonlarda Postoperatif İleusu Önlemek İçin Tuhaf Bir Yol: Sakız Çiğneme**Zeynep KAMALAK<sup>1</sup>, Nermin KÖŞÜŞ<sup>2</sup>, Aydın KÖŞÜŞ<sup>2</sup>, Müberra NAMLI KALEM<sup>3</sup>, Deniz HIZLI<sup>2</sup>, Banu AKÇAL<sup>3</sup>, Hasan KAFALI<sup>4</sup><sup>1</sup> Afşin Public Hospital, Department of Obstetric & Gynecology, Kahramanmaraş, Turkey<sup>2</sup> Turgut Özal University, Faculty of Medicine, Department of Obstetric & Gynecology, Ankara, Turkey<sup>3</sup> Turgut Özal University, Faculty of Medicine, Department of Obstetric & Gynecology, Ankara, Turkey<sup>4</sup> Medical Park Hospital, Department of Obstetric & Gynecology, Ankara, Turkey<sup>5</sup> Gazi University, Faculty of Medicine, Department of Obstetric & Gynecology, Ankara, Turkey**ABSTRACT****Aim:** The purpose of this study was to evaluate whether sugarless gum chewing promotes recovery of bowel function after total abdominal hysterectomy and bilateral salpingo-oophorectomy. Also post operative analgesic and anti-emetic requirement were assessed.**Material and Methods:** 98 patients were enrolled into the study; 54 (55.1%) patients in the study (gumchewing) group and 44 (44.9%) cases in the control group. Patients in the gum chewing group chewed gum six times per day during post operative period and were asked to chew gum at least half an hour each time. The outcomes of the study were time to first flatus, first bowel movement, duration of hospitalization and need of analgesics and/or antiemetics during postoperative period.**Results:** Median flatus time was 7 hours in the gum chewing group and 9 hours in the control group. There was statistically significant difference between two groups in terms of time to flatus. Bowel sounds appeared significantly earlier in the study group. At postoperative eighth hour, bowel sounds were active in 53 (98.1%) cases in the study group, and 23 (52.3%) cases in the control group.**Conclusion:** Gum chewing following gynecological operations offers significant benefits in reducing the time to resolution of bowel functions. It is a simple, inexpensive, convenient, and physiological method for enhancing the recovery of bowel function.**Key Words:** Postoperative ileus, gum chewing, surgery.**ÖZET****Amaç:** Bu çalışmanın amacı sakız çiğnemenin total abdominal histerektomive bilateral salpingo- oofektomi ameliyatından sonra bağırsak fonksiyonlarının geri dönüşünde etkisi olup olmadığının değerlendirilmesidir. Ayrıca postoperatif ve analjezik ve antiemetik ihtiyacı da değerlendirildi.**Gereç ve Yöntemler:** Çalışmaya 98 hasta katıldı; çalışma grubunda (sakız çiğneyen) 54(%55.1) hasta, kontrol grubunda (sakız çiğnemeyen) 44 (%44.9) hasta mevcuttu.

Çalışma grubuna ameliyat sonrası günde 6 kez ve her seferinde en az yarım saat sakız çiğnemeleri söylendi. Ameliyat sonrası dönemde gaz çıkarana kadar geçen süre, ilk barsak hareketleri oluşana kadar geçen süre, hastaların analjezik ve antiemetik ihtiyaçları ve hastanede kalış süreleri değerlendirildi.

**Bulgular:** Sakız çiğneyen grupta gaz çıkarana kadar geçen süre ortalama 7 saat, kontrol grubunda ortalama 9 saat olarak bulunmuştur, iki grup arasında gaz çıkarma sürelerinde anlamlı farklılık saptanmıştır. Bağırsak seslerinin tespit edilmesi sakız çiğneyen grupta kontrol grubuna göre daha erken olmuştur. Çalışma grubunda postoperative 8.saatte 53 (%98.1) hastada bağırsak sesleri aktifken, kontrol grubunda bu sayı 23 (%52.3) olarak bulundu.**Sonuç:** Jinekolojik operasyonlardan sonra sakız çiğnemenin bağırsak fonksiyonlarının geri dönüş süresini kısaltmak konusunda anlamlı etkisi mevcuttur. Sakız çiğnemesi bağırsak fonksiyonlarının iyileştirilmesinde basit, ucuz ve güvenle uygulanabilecek fizyolojiye uygun bir yöntemdir.**Anahtar Kelimeler:** Postoperatif ileus, sakız çiğneme, cerrahi.

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## Introduction

Postoperative ileus (POI) is defined as the transient inhibition of normal gastrointestinal motility following abdominal surgery, typically lasting for 3-5 days (1). After the abdominal surgery, one of the important point is return of bowel function. It prolongs postoperative hospital stay and contributes to delayed recovery.

Sham feeding is a method to increase bowel motility (2-3). One promising intervention to achieve this goal is to have patients chew gum several times per day in the early postoperative period to stimulate the cephalic-vagal reflex and bowel peristalsis by hormonal release and of course without complications of oral feeding (4-5).

Sugarless chewing gums include hexitols which are the sugar alcohol obtained on the reduction of a hexose. Natural examples are sorbitol, mannitol. Hexitols are known to cause gastrointestinal symptoms such as gas, bloating, and abdominal cramps in a dose-dependent manner (6).

Xylitol is a naturally occurring alcohol found in most plant material, including many fruits and vegetables. It is a five-carbon sugar alcohol derived from xylose and is widely used as a sugar substitute in "sugar-free" chewing gums, mints, and other candies. Xylitol tastes sweet but, unlike sugar, it is not converted in the mouth to acids that cause tooth decay. It reduces levels of decay-causing bacteria in saliva and also acts against some bacteria that cause ear infections. It is barely absorbed from the small intestine without digestion. The ingestion of a sufficiently large amount of non absorbable and non digestive sugar substitutes causes overt diarrhea, and frequently minor symptoms such as abdominal distention and flatus (7).

Many studies have stated that there is consistent benefit for patients from gum chewing after the intestinal surgery in the form of decreased time to first flatus, bowel movements, and postoperative hospital stay (8). In abdominal surgery, apart from intestinal anastomosis, the gum chewing has also proved to be useful in decreasing POI following caesarian section (9). The purpose of this study was to evaluate whether sugarless gum chewing promotes recovery of bowel function after total abdominal hysterectomy and bilateral salpingooforectomy. Also post operative analgesic and anti-emetic requirement were assessed.

## Materials and Methods

This prospective, comparative study was performed at the Gynecology Clinic of Afşin Public Hospital from July 2011 to July 2012 after obtaining approval of the Fatih University Hospital Ethics Committee and complied with the principles of the Helsinki Declaration. Possible complications related to surgery and its expected results were preoperatively explained to all patients, and informed consent was obtained from all patients. Moreover, all patients were informed in detail about the study, and an informed consent was taken from all enrolled patients. All of the cases were operated by the same surgeon and were given anaesthesia by the same anesthesiologist.

Patients with serious cardiovascular, pulmonary, renal, hepatic, hematologic and other systemic diseases, patients with severe biochemical derangement, mechanical obstruction, inflammatory intestinal disease, psychiatric and orthopedic disorders that may limit patient mobilization during the postoperative period and patients who received opioid analgesics 4 weeks

before the surgery and with a history of drug dependency were excluded from the study. Prokinetic drugs and premedication were not administered to the study patients.

Following induction with 2 mg/kg of Diprivan, 0.1 mg/kg of vecuronium bromide, and 1 mg/kg of fentanyl, anesthesia was maintained with 40% oxygen of which 2% consisted of sevoflurane and 60% consisted of nitrous oxide. At the end of the operation, the neuromuscular block was reversed with 0.04 mg/kg of neostigmine methyl sulfate and 0.5 to 1 mg/kg of atropine sulfate. Following revival from anesthesia, 1 to 1.5 mg/kg of tramadole was infused with the intention of providing analgesia. Intraoperative fluid replacement was limited to 1,000 mL of isotonic saline solution + 500 mL of 5% dextrose solution. Decisions regarding additional fluid infusions and blood transfusions were made intraoperatively by discussion with the anesthesiologist. The body temperature of the patient during the operation was maintained between 35.8 C° and 37 C°. The patients were mobilized in the eighth postoperative hour. Ondansetron hydrochloride (8 mg as a single daily dose) was used as an antiemetic.

Polyglactin (Vicryl) number 1 suture was used for vaginal cuff and fascia closure. The skin was sutured by 3-0 polyglactin (Vicryl) subcutaneously. The surgical team cleansed their hands by sterile serum before starting the surgery. Demographic data, clinical diagnosis, duration of surgery, length of incision, type of anesthesia, opioid analgesic usage time, and time of discharge from hospital were recorded. Patients in the gum chewing group chewed gum six times per day and were asked to chew gum at least half an hour each time. Patients started chewing gum postoperatively second hour until the passage of first flatus or defecation. Commercially available sugar-free gum (Vivident Xylit, Perfetti Van Melle, Istanbul, Turkey®) was used for this study. All patients in the study group tolerated gum chewing quite well.

The outcomes of the study were time to first flatus, first bowel movement, duration of hospitalization and need of analgesics and/or antiemetics during postoperative period. Bowel sounds were checked routinely two times after the operation (at fourth and eighth hours). For postoperative pain relief, diclofenac sodium injection was done every 8 hours for the initial day after the surgery, then it was given as per demand. The first passage of flatus postoperatively was noted. Oral nutrition was delayed until normoactive intestinal sounds were detected or normal gas passing occurred.

## Statistical Analyses

Statistical analyses were performed using SPSS ver. 15.0 (SPSS Inc., Chicago, IL, USA). Data were controlled in terms of conformity to normal distribution by Shapiro-Wilk test. Mann-Whitney test was used for continuous data and Chi-square with Fischer Exact tests were conducted to test the distribution between categorical variables. Logistic regression analysis was used to evaluate the parameters that affected flatus.  $P < 0.05$  is accepted as statistically significant.

## Results

There was 54 (55.1%) patients in the study (gumchewing) group and 44 (44.9%) cases in the control group. In the study group 15 cases had previous operations: 4 patients had appendectomy, 4 patients had cholecystectomy, 5 patients had cesarean section, 1 patient had myomectomy and 1 patient had an operation because of renal tumor previously. In the control group there

was only 2 patients who had appendectomy previously. All patients in the study group tolerated gum chewing quite well. Demographic and surgical characteristics of groups are shown in Table 1.

The median duration of surgery was 90 (60-150) min in the study group and 85 (60-115) min in the control group ( $p=0.208$ ). The difference was not statistically significant. Postoperative analgesic requirement/case in gum chewing group is 1 (1-2) and in control group is 0.5 (0-2) /case. The difference between groups was significant ( $p<0.001$ ). The postoperative antiemetic need in the gum chewing group is 12 times / group (22.2%) and in control group is 22 times / group (50.0%). The difference was statistically significant ( $p=0.006$ ).

Median flatus time was 8 hours. It was 7 (5-12) hours in the gum chewing group and 9 (6-12) hours in the control group. There was statistically significant difference between two groups in terms of time to flatus ( $p<0.001$ ). Bowel sounds appeared significantly earlier in the study group. Bowel sounds were active at fourth hour after operation in 40 (74.1%) patients in the study group, and 5 cases (11.4%) in the control group ( $p<0.001$ ). At postoperative eighth hour, bowel sounds were active in nearly all cases (53 cases (98.1%)) in the study group, and only 23 (52.3%) cases in the control group ( $p<0.001$ ).

Logistic regression analysis was used to evaluate the parameters to predict flatus time. Patients were divided into two groups according to flatus time as before and after eighth hour postoperatively. The regression analysis used by Backward method was completed at seven step. Chewing gum for eight hours, having bowel activity at the fourth postoperative hour, operation with regional anesthesia, age and duration of surgery were the parameters that were affected flatus time ( $p<0.05$ ). Results of regression analysis is shown in Table 2.

## Discussion

Postoperative ileus is regarded as an inevitable response to abdominal surgery and is a major contributing factor to postoperative pain and discomfort associated with abdominal distension, nausea, vomiting, and cramping pain (10). Pathogenesis of postoperative ileus is a multi-factorial entity jointly composed by inhibitory, spinal, and sympathetic reflexes, neurotransmitters, local inflammatory factors, and humoral agents (11-13). Intestinal trauma occurring secondarily to surgical manipulation during operation and longer operation period are the risk factors for postoperative ileus (14). Another risk factor which is the most significant and easy controllable, is usage of narcotic analgesics during post operative period (15).

Gum chewing is a form of sham feeding, which could encourage gastrointestinal motility through cephalic-vagal stimulation. Also this is a way to increase the production of both saliva and pancreatic secretions (16).

In a meta-analysis by de Castro et. al, it was concluded that gum chewing has a favorable effect on time to flatus and defecation but no significant effect on the hospital stay (17). Chewing sugarless gum following elective intestinal resection is associated with improved outcomes (18).

In obstetrics practice, there are a lot of study about chewing gum after the cesarean section. The common finding is gum chewing after cesarean section is safe, well tolerated, and associated with rapid resumption of intestinal motility and shorter hospital stay; with potential impact on reducing the overall

healthcare costs (19-20).

This study was designed to investigate the effect of chewing gum on postoperative bowel activity, analgesic and antiemetic requirement after gynecologic operations. Sugarless chewing gums might also be playing a role in the amelioration of POI because these are known to increase gastrointestinal motility, but also cause gastrointestinal symptoms such as gas, bloating, and abdominal cramps in a dose-dependent manner. Cause of this that the sugar alcohols can pull liquid into the bowel and cause these gastrointestinal symptoms (6).

There are many studies in literature about this subject but we could not find any similar study in gynecologic patient population. The other important result of this study is that it was shown that chewing gum is an effective method for prevention of POI in patients who underwent gynecologic operation with history of previous surgery.

This study had a few limitations: First, it was a hospital based study with a relatively small sample size. Postoperative analgesic usage, postoperative antiemetic need and previous operations can effect postoperative bowel function. But the number of cases were not enough to compare these parameters in the two groups.

In conclusion, gum chewing following gynecological operations offers significant benefits in reducing the time to resolution of bowel functions. It is a simple, inexpensive, convenient, and physiological method for enhancing the recovery of bowel function. Gum chewing can significantly reduce morbidity after gynecological surgery.

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