

## Original Research Article

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# Use of gatekeeper in obese patients with fecal incontinence before bariatric surgery, is it improving the results?

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## ABSTRACT

**Background:** Fecal incontinence or bowel incontinence is a lack of defecation control with loss of bowel continent for gas, liquid, or solid content. Causes of incontinence are so different and might occur as a part of diarrhea or constipation. After following up patients with gastric bypass surgery for bariatric purpose we observe that most of them develop incontinence by different grades after bariatric surgery. Also, some of them complaining from soiling by different degrees before any operative procedure. Gatekeeper is a bulking agent recently introduced for treatment of fecal incontinence, implants of polyacrylonitrile (4-6) implants are inserted in inter-sphincteric space (Gatekeeper, THD) is used as a bulking agent to increase the volume in the inter-sphincteric space in cases of fecal incontinence follow-up was at 2, 4, 8 months. Aim is to evaluate efficacy of gatekeeper application in obese patient with fecal incontinence after bypass bariatric surgery.

**Methods:** Thirty obese patients (19 females) and (11 males) undergoing bariatric surgery at Alsalama Hospital Abu Dhabi from the period between July 2015 to July 2017, are classified into two groups (group I) 15 patients (9 females and 6 males) are subjected to gatekeeper before gastric bypass surgeries and (group II) 15 patients (10 females and 5 males) not subjected to the use of gatekeeper and both groups were followed at 2, 4 and 8 months postoperative.

**Results:** This randomized controlled study was conducted on 30 patients between July 2015 to July 2017 at Alsalama hospital Abu Dhabi. The use of gatekeeper in obese patients undergo bypass surgery is an effective technique to improve liquid stool incontinence.

**Conclusions:** The use of gatekeeper in obese patients with fecal incontinence before gastric bypass surgery has improved the incontinence postoperative signs and symptoms.

**Keywords:** Gatekeeper, Incontinence, Obesity

## INTRODUCTION

fecal incontinence (FI) is not a diagnosis but it is a symptom for a lot of cause's. Usually, it is a multifactorial problem and more than 85% of persons can compensate the incontinence for a certain period of time.<sup>1</sup> Most of causes of (FI) for patients over 18 years includes structural deficits as sphincter trauma, degeneration, perianal fistula, and rectal prolapse. Also, neurological

problems as spinal cord injury, multiple sclerosis, spina bifida.<sup>2</sup> Behavioral dysfunction as dementia, inflammatory bowel disease, as ulcerative colitis, Chron's disease. DM also considered as a cause with unknown mechanism.<sup>3</sup>

Diagnosis of (FI) usually done by direct examination including anoscopy, sigmoidoscopy and colonoscopy for evaluation of the presence of inflammatory masses.

Manometric study measures the internal pressure of different areas of lower digestive tract during resting, contraction and straining tone reflected on a diagrammatic chart.<sup>4</sup> Also, ultrasonic rectal examination and MRI examination of the rectum help in diagnosis of anomalies in pelvic floor, rectal wall, and or anal sphincters, also stool examination may reflect the cause of diarrhea.<sup>5</sup>

### Aim of the study

Is to evaluate the efficiency of gatekeeper application in obese patients with fecal incontinence after gastric bypass bariatric surgery.

### METHODS

Thirty obese patients (19 females) and (11 males) undergoing bariatric for gastric bypass are classified into two groups (group I) 15 patients (9 females and 6 males) are subjected to gatekeeper before gastric bypass surgeries and (group II) 15 patients (10 females and 5 males) are not subjected to the use of gatekeeper and both groups were followed at 2, 4 and 8 months postoperative.

### Preoperative preparation

All patients prepared for incontinence operation were investigated using different diagnostic tools as complete history with definition of (FI) and severity (flatus, liquid,

or solid stool), history of bowel movement (frequency, duration and pattern) history of soiling after anal surgery, history of urgency which reflect the rectal compliance, history of urge which reflects neurological causes, after that we determine stool consistency which reflects inflammatory bowel disease, dietary habits, malabsorption, or irritable bowel.<sup>6</sup>

Complete physical examination including perineum, digital rectal examination, abdominal examination, neurological examination (extremity reflexes, sensory and muscle strength). Anorectal endoscopy to exclude diseases (hemorrhoids, fistula, malignancy, etc).<sup>7</sup> (BMI) body mass index scoring for all patients also was detected.

### Jorge and Wexner scoring system

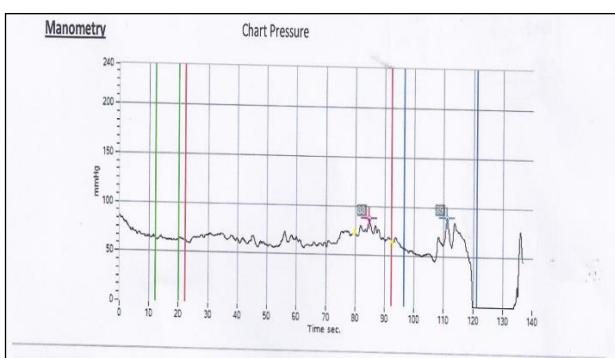
The scoring system (Jorge and Wexner) is a scoring which gives basic information's for five basic categories; type of incontinence solid, liquid, or gas, the usage of pads and life style changes. This scoring system we used in the study.

This scoring system as shown in (Table 1) gives us information's about the presence or absence of incontinence by measuring the different symptoms and signs in the form of type of incontinence (solid, liquid, gas), the usage of anal pads by patient and the presence of psychological alteration.<sup>8</sup>

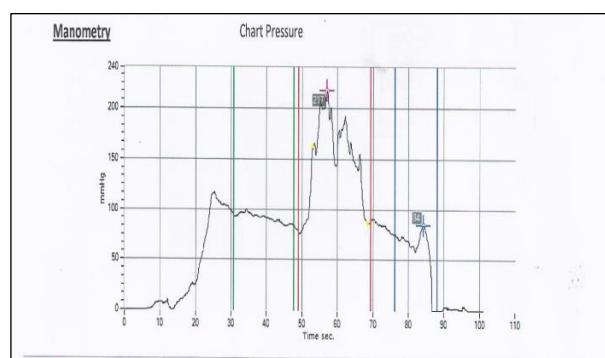
**Table 1: Jorge and Wexner scoring system.**

Type of incontinence	Never	Rarely	Sometimes	Usually	Always
Solid	0	1	2	3	4
Liquid	0	1	2	3	4
Gas	0	1	2	3	4
Wears pads	0	1	2	3	4
Life style alteration	0	1	2	3	4

Rarely <1/month: 1/month. Sometimes < 1/weak. usually <1/day. Always >1/ day. 0 is perfect, 20=complete incontinence.



**Figure 1: Anorectal manometry- patient with incontinence.**



**Figure 2: Anorectal manometry- normal study.**

### Special physiological studies

Anorectal manometry, which measures the anal canal pressure as shown in case of incontinence (Figure 1) and with normal study as shown in (Figure 2). It shows electric changes during rest, contraction of muscle and during voluntary squeeze.<sup>9</sup> If the curve of the manometric study was flat during contraction this means there is incontinence as shown in (Figure 1) between the two vertical red lines from the second 20 to the second 90 during applying the test.

And if the curve of the study elevated above 80 mmHg this means it is normal study as shown in (Figure 2) between the two vertical red lines from the second 50 to the second 70. This manometric study measures the contraction of the anal sphincter muscle during resting time represented in the test between the vertical green lines in (Figure 2) and it is flat in patients with incontinence as shown in between the vertical green lines from the second 10 to the second 20 in (Figure 1).

The squeezing time represented between the two vertical red lines and it is flat and below 80 mmHg in case of incontinence as shown in (Figure 1) from second 20 to the second 90 and elevated above 80 mmHg in normal study as shown in (Figure 2) from second 50 to second 70. The straining time represented between the two vertical blue lines and represents the capability of the patient to expel the probe outside the anal canal.

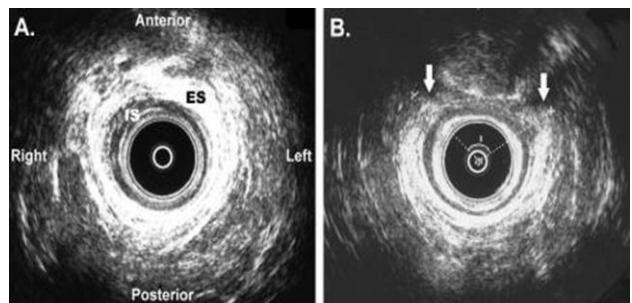
In case of incontinence the duration is prolonged as shown in (Figure 1) between the two below lines from second 95 to second 120 and the duration of probe expulsion is shorter in normal study as shown in (Figure 2) between the vertical blue lines from second 75 to second 90. Manometric study of patients with normal curve pressure during resting (between vertical green lines) above 80mmhg, during straining (between vertical red lines) the pressure increases above 100mmHg and short duration during squeezing (between vertical blue lines) indicating normal study.

### Pudendal nerve terminal motor latency

Measures the length of time required for a fixed electrical stimulus to travel along the pudendal nerve to the sphincter complex.<sup>10,11</sup>

### Anal endosonography

In this test the presence of internal (hypoechoic) and external (hyperechoic) shadow of sphincter muscles are best seen as two intact rings in the mid anal canal as shown in (Figure 3A) which indicates normal intact sphincteric rings, and the muscle layers appears destroyed if the rings are not completely intact as shown in (Figure 3B). With destruction of external sphincter between the two arrows.



**Figure 3: A) normal sphincteric rings, internal sphincteric (IS) and external sphincteric (ES), B) Destruction of external sphincteric ring between arrows.**

Endoluminal MRI: visualization of normal anatomy and pathology through endoluminal magnetic resonance image (MRI). Done with application of special probe.



**Figure 4: Loading of gatekeeper cartilage.**



**Figure 5: Application of gatekeeper at intersphincteric space.**

### Procedure

Gatekeeper is a bulking agent recently introduced for fecal incontinence, made of implants of polyacrylonitrile implants came as six implants included separately in cartilages as in (Figure 6), loaded into the gun of the instrument one by one as shown in the (Figure 4) and inserted into the inter-sphincteric space under local or

spinal anesthesia as in (Figure 5) guided by endosonography.



**Figure 6: Cartilages of the gatekeeper, everyone pack comes with 6 separately packed cartilages and the firing gun.**

For patients subjected to bypass surgery just before the bariatric procedure, patients before bypass surgery adjusted in lithotomy position, application of the gatekeeper cartilages one by one into the inter-sphincteric space at 3, 6, 9 and 12 o'clock two additional implants inserted into 1 and 2 o'clock, after small incisions done over the perianal area over the corresponding sites for application, after that we change the patient position and proceed for the bariatric gastric bypass procedure, follow up of patients done at 2, 4, 8 months.

## RESULTS

This randomized controlled study was conducted on 30 patients between July 2015 to July 2017 at Alsalama Hospital Abu Dhabi, the age the sex and the BMI (body mass index) of the patients was listed at (Table 2).

Patients were divided randomly into two groups, (group I) subjected to Gatekeeper before bariatric surgery, and (group II) not subjected to Gatekeeper. there is no significant difference between both groups regarding their demographic data or BMI (body mass index) ratio as shown in (Table 2).

Demographic data of patients including age, sex and BMI (body mass index) ratio measurements for male and female of each group (Table 2). The incontinence of patients to liquid stool in (group I) before surgery was 50% for male and 55% for female, and after surgery was 0% for male and 11% for female as shown in (Table 3).

In (group II) before surgery there was 60% incontinence for male not changed after surgery and 40% incontinence for female increased to 60% after surgery as shown in (Table 3). Incontinence of patients to liquid stool for male and female in both groups before and after surgery (Table 3).

## DISCUSSION

Long time ago the use of gastric bypass procedure for treatment of morbid obesity takes a lot of modifications and techniques. Along with the follow up of the morbidly obese patients in our locality and from repeated history of the patients we notice the presence of soiling of stool by different grades in many of the patients.

By follow up the patients after surgery at 4, 6 and 8 months we observe exaggeration of the condition of the soiling proved by marked changes in manometric study curve for the patients and they complain from urge and soiling up to use pads in some of them not habituated before. The theories for these changes may be due to loosening of the stool after operation, loss of perianal pad of fat due to marked loss of weight and muscle wasting from loss of weight.<sup>6</sup>

Richter et al, arouse attention before for the soiling of the patients with morbid obesity before surgery due to a lot of co-factors as muscle weakness, marked increase of intra-abdominal pressure and rapid bowel habit with loosening of the stool. Robson et al.<sup>1,5</sup> Also comment about post-operative loose of perianal fat after bariatric surgery with partial loss of rectal and perineal support with increased possibility of post-operative soiling and even rectal prolapse.

So, the preoperative co factors for morbidly obese patients with others postoperatively after marked weight loss increase the chance of those patients to have some sort of incontinence before surgery exaggerated by severe loss of weight after surgery.<sup>12</sup>

it seems that use of gatekeeper in obese patient, who will undergo bypass surgery, is an effective technique to improve or prevent liquid stool incontinence complications and also prevent its psychological impact on those patients.<sup>13,14</sup> As in (group I) we select age from 24 years to 50 years and in (group II) we select age from 25 years to 49 years and BMI ratio from 45 to 58 in (group I), and from 46 to 57 in (group II). And before surgery there was 3 from the male patients with total number of 6 (50 %) and 5 from female patients with total number of 9 (55%) represent incontinence by different grades in (group I) and after bariatric surgery the incontinence become 0% for male patients and 11% of female patients. In (group II) 3 from total number of 5 male (60%) with incontinence not changed after bariatric surgery.

And 4 from total number of 10 female patients was incontinent (40%) increased to 6 from them develops incontinence (60%) after bariatric surgery. From these results, surgical correction of fecal incontinence is the treatment of choice before morbid obesity operations, but the low number of patients in this study cannot give a final conclusion and still need more studies with higher number of patients.<sup>12</sup>

## CONCLUSION

The use of gatekeeper in morbid obese patients complaining from fecal incontinence before gastric bypass operations for treatment of obesity has improved the incontinence after surgery signs and symptoms of (group I) patients both for male and female.

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