*International Journal of Current Research and Academic Review*

**ISSN: 2347-3215 Volume 3 Number 6 (June-2015) pp. 12-19**

www.ijcrar.com

# Outcomes of modified jejuno-ileal bypass surgery

**Salman Dehkhoda[1], Nahid Arian Pour[2]* and Ali Karbalaei Khani[1]**

[1]Imam Reza Hospital, Tehran, Iran
[2]AJA University of Medical Sciences, Tehran, Iran
***Corresponding author***

**KEYWORDS**

Bariatric surgery,
Jejuno-ileal
bypass surgery,
Obesity,
Weight loss,
BMI,
Surgery

**A B S T R A C T**

Obesity is a serious, multi-factorial, chronic illness affecting patients of all ages and continues to increase in prevalence at an alarming rate. The present study aims to assess the outcomes of modified jejuno-ileal bypass surgery. 200 obese persons (157 women & 43 men) were operated in Imam Reza & Shahryar hospitals- Tehran- Iran from 2005-2011 employing modified jejuno-ileal bypass surgery. Jejunum was cut at about 20cm of treitz ligament. Its proximal end was anastomosed end to side wise to terminal ileum at 30–35 centimeter away from ileo-caecal valve and distal end was anastomosed to the gall bladder. Patients' age ranged from 16 to 55 years. Follow up showed a significant weight loss after operation (P<.001) without common side effects of jejuno-ileal bypass surgery and a steady weight loss up to two years. Complications of obesity like high blood pressure, diabetes and cholesterol reduced significantly (P<.001). Findings indicate that the modified jejuno-ileal bypass operation is a safe and effective bariatric surgery in reducing weight and maintaining weight loss for at least 5 years, with least complications for the patient, especially serious liver disease and anastomosis leak.

## Introduction

Obesity is a serious, multi-factorial illness affecting patients of all ages and continues to increase in prevalence at an alarming rate (Friedenberg, 2002). Severe obesity which can be treated with great difficulty is a chronic condition (Weber). At present, there is no non-surgical method for losing weight and maintaining the lost weight in the obese (O'Brien and Dixon, 2003).

Surgery promotes weight loss by restricting food intake or interrupting the digestive processes. On this basis, bariatric surgery is categorized into two main types: restrictive and mal-absorptive (Gracia, 2009). In mal-absorptive procedures, the gastrointestinal tract is surgically altered to induce mal-absorption and hence decrease calorie intake (Fazel *et al.*, 2007).

The classic mal-absorptive procedure i.e. jejunoileal bypass (JIB), is a surgical weight loss procedure with many modifications to overcome the serious problems of classic jejunoileal bypass surgery (Shaffer, 2006). Though, in majority of these modifications the de-functionalized limb of ileum accounts for many serious complications due to stasis and bacterial overgrowth (Fazel *et al.*, 2007).

Bariatric bypass operations as major surgery come with the risk of complications (Johnson). Any surgical procedure has the potential risk of infection. It is conventional to use any technique to reduce the risk of bacterial contamination of the surgical site (Dehkhoda *et al.*, 2012).

The present study aims to assess the outcomes of modified jejuno-ileal bypass surgery.

## Materials and Methods

Study Cases- 157 obese women and 43 obese men referring to Imam Reza & Shahryar hospitals- Tehran- Iran from 2005 to 2011 for bariatric surgery were included in this clinical trial on the basis of the inclusion and exclusion criteria.

Inclusion criteria- Obese patients of both sexes aged 16–55 years with BMI more than 40 or those having 100 lb more than ideal weight.

Exclusion criteria- patients aged more than 55 and less than 15 years, patients suffering from hypothyroidism and insulin-dependent diabetes, those with previous gastrointestinal surgery excepting appendectomy or presence of any pathological disorder in digestive system, patients under treatment with corticosteroids and antibiotics, alcohol addicts and all psychotic patients.

Before surgery laboratory tests such as liver function, blood sugar, blood lipids, coagulation, renal function tests, Complete Blood Count (CBC), tests for measuring Na & K levels, Electro Cardiogram (EKG) and chest X-ray were requested for all patients. All cases were operated employing jejuno-ileal bypass procedure with some modifications (M JIB). Patients were informed about the procedure of the operation and a consent form was signed.

Study Design- Patients were divided on the basis of their BMI, into two groups of between 40 and 45 with 112 women and 30 men (71% cases) and more than 45 with 45 women and 13 men (29% cases). Demographic features of the patients of two groups are presented in Table I.

Operation Procedure-In the operation room, after prep & drep of the patient, an upper midline incision was made. After exploring the abdomen, jejunum was cut at about 20 cm of treitz ligament and its proximal end was anastomosed end to side wise to terminal ileum at 30–35 centimeter away from ileo-caecal valve. Distal end of jejunum was anastomosed side to side to the gall bladder (Fig 1).

Post operation -NG tube, inserted for all patients, was removed on day 2 post operation. Next day Foley catheter was removed. On third day, patients were fed liquid diet.

Patients were watched especially for any sign of infection daily during first week and weekly up to one month.

Merits of this modification of JIB:

-The chance of serious side effects especially serious liver disease is greatly reduced.

-Probability of anastomose leak is nil in this procedure as stomach and duodenum are left intact.
-Diarrhea is less common among patients operated by this procedure and is easily controlled by Diphenoxylate.
-Bile flows into bypassed intestine thereby, bacterial growth is prohibited.
- This modification of JIB is very effective in inducing and maintaining weight loss.

Patients' assessment and follow up- Patients were followed up for about 4 to 10 years. First month post operation patients were visited every week and second month onward every two weeks which was changed to monthly visit till one year. At last, patients were visited every 6 month. During follow up patients were weighed and examined regarding their weight loss, clinical and para-clinical evaluation of their obesity and surgery related complications and improvement.

Statistical analysis was performed using SPSS software.

## Results and Discussion

Patients' mean age was 30.05±11.02 years. Operation time varied from 2-3 hours with mean of 2.30±0.10 hours. As is shown in Table 1, though patients of both groups suffered obesity related complications, yet the occurrence rate of complications between the two groups differed significantly (P<.001).

Our patients lost approximately 78% of excess weight within two years. The peak weight loss occurred one month post operation. Follow up of the patients shows that weight loss among men and women were not different significantly (p>.05).

Benefits of the operation - As a consequence of weight loss following MJIB, some of the measured complications of obesity like high blood pressure, diabetes and cholesterol reduced significantly (P<.001) except knee arthrosis which was accompanied by pain relief only.

Diabetes was cured in 86% of the cases and in the remaining drug dose was reduced. 89% of the patients suffering hyperlipidemia and 85% suffering hypertension improved and withdrawal of medication occurred 6–12 months post operation.

Complications of the operation Complications of the patients after MJIB surgery is presented in table 2.

Only 6% of patients suffered intensive diarrhea, requiring medication and one patient had diarrhea which lasted 7–8 months. After treating diarrhea, anorectal complications (fissure) were also cured. Abdominal hernia was seen in 17 women and 5 men. Herniorhaphy was carried out 2-3 years post operation to treat hernia.

None of our cases required revision of the surgery. Anastomotic leak was nil in our study. No case of dumping syndrome and nutritional deficiencies was observed.

Incidence of obesity is increasing rapidly in most parts of the world (Malekzadeh *et al.,* 2005; Bahrami *et al.,* 2006; Davis, 2007). In Iran also more than 60% are overweight and over 25% of the population are obese (Fazel *et al.,* 2007).

In the present study, total mean age of surgery recipients (30.05±11.02 years) was comparatively lower than the mean age of bariatric surgery recipients in Canada i.e. 43.6±11.1 years (Padwal *et al.,* 2012), 78.5% of the patients were women and 142 out of 200 cases had BMI less than 40 indicating that overweight people with

obesity related complications more than morbidly obese cases are keen to undergo bariatric surgery. It may be pointed that obesity related complications, sex-related disparities and mental and physical health of patients are the reasons for higher tendency of women to undergo bariatric surgery (Davis, 2007; Padwal *et al.,* 2012, 2010). Padwal *et al.* (2010) also stated that women had higher tendency for bariatric surgery.

In the classic mal-absorptive procedure, liver dysfunction is common. Even in another modification of jejuno-ileal bypass surgery (Fazel *et al.,* 2007), liver involvement persists while in the procedure we employed, weight loss is achieved without causing clinically significant liver disease with prohibition of unrestricted bacterial growth, absorption of fat soluble vitamins, elimination of vitamin deficiency and anemia. In this procedure, calorie absorption is restricted; this is especially helpful for those who are psychologically unable to diet after operation.

The overall success of a bariatric surgery and the extent of weight loss and its durability differs depending on the various factors including the surgical procedure employed (Snyder *et al.,* 2009). In the present study, about 78% of the patients lost excess weight within two years. Marceau *et al.* (2001) reports a remarkable constancy of weight loss with 74% excess weight loss at 2 years and 78% excess weight loss at 12 years (Marceau *et al.,* 2001). Comparatively higher rate of weight loss in our study is related to some extent to the efficacy of this procedure, younger age of the surgery-recipients who have stronger motivation for weight loss.

Follow up of the patients for 4–10 years revealed that after two years of operation no significant weight change is observed while in restrictive operations, over the long term, only a fourth of the patients keep that much weight off and weight gain occurs (Marceau *et al.,* 2001). Das *et al.* (2003) reported the mean duration of weight loss after gastric bypass surgery as 14 ± 2 months.

In bariatric surgery, what is more important than weight loss is reducing the complications of obesity (Gagnon and Sheff, 2012). Gagnon and Sheff (2012) reported that following jejuno-ileal bypass surgery, 90% of obesity related complications subsided in their patients. Hypertension and hyperlipidemia are the complications of the obesity that improve after surgery (Nguyen *et al.,* 2006; Sears *et al.,* 2008).

In a study, 12 months after surgery 86% of patients with hyperlipidemia and 81% suffering hypertension no longer required medication (Vetter *et al.,* 2007). In the present study, 89% of patients suffering hyperlipidemia and 82% suffering hypertension were cured; indicating a significant difference in the occurrence of obesity related complications ($P<.001$). Withdrawal of medication occurred 6-12 months post operation while drug dose was reduced in other patients with the same complications.

One of the benefits of bariatric surgery is lowering the blood sugar and even elimination of type 2 diabetes (Nguyen *et al.,* 2006). Studies have found that 72–81% of patients with type 2 diabetes have been able to stop diabetes medications at one year follow-up (Nguyen *et al.,* 2006; Sears *et al.,* 2008). In the present study, diabetes was cured in almost 81% of cases leading to withdrawal of medication.

**Table.1** Demographic features of Patients undergoing Modified JIB surgery

| Grouping | Gender | Mean Age | Obesity related disorders before operation | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | High Cholesterol | High blood pressure | High blood sugar | PCOD | Respiratory disorder | Skeletal disorder |
| BMI(40-45) (142) | 112W+3oM | 30.00±10.48 | 2W+5M | 1W+2M | 6W+4M | - | - | 15W+11M |
| BMI ≥45 (58) | 45W+13M | 30.10±11.57 | 4W+8M | 3W+4M | 30W+18M | 1 | 1W+0M | 30W+20M |
| Total (200) | 157W+43M | 30.05±11.02 | 6W+13M | 4W+6M | 48W+28M | 1 | 1W+0M | 45W+31M |

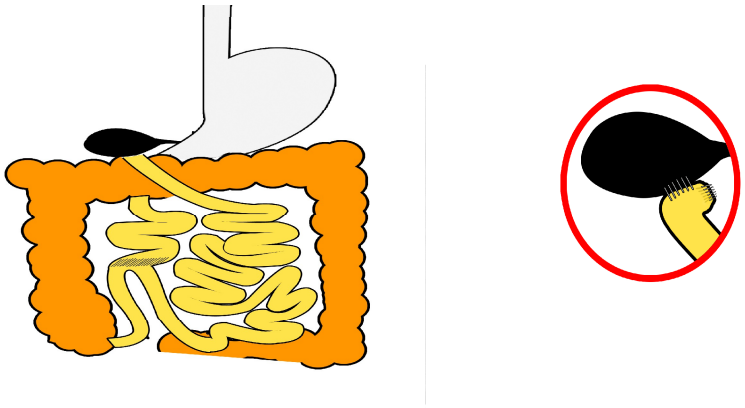
W =Woman M= Man

**Table.2** Observed surgical complications

| No | Complication | Occurrence rate |
|---|---|---|
| 1 | Anorectal complications (fissure & hemorrhoid) | 6% |
| 2 | Elevated Hepatic Enzymes<br>After 4 months<br>After 6 months | <br>8%<br>- |
| 3 | Diarrhea:<br>Within 2 weeks<br>Within 1 month<br>After 1 month | <br>56%<br>15%<br>1% |
| 4 | Gallstone formation | 1 % |
| 5 | Abdominal hernia | 11% |
| 6 | Hyperoxaluria, Steatorrhea | |

W =Woman M=Man

**Fig.1** Modified JIB



Like any other surgery, bariatric surgery carries some risk of complications like bleeding, anastomotic leak, wound infection, thromboembolism, and anastomotic strictures (Vetter *et al.*, 2007). To prevent anastomotic leak which is accompanied by high mortality, we operated the patients using open surgery. Thereby, the rate of anastomotic leak was nil.

As in this procedure stomach, duodenum and proximal part of jejunum are left intact and on the other hand, there is no limitation in food intake, our patients did not face malnutrition and its long- term complications like iron, vitamin B12 and micronutrient deficiencies.

Cholelithiasis is another complication of bariatric surgery (National Institutes of Health, 2008). In the present study, lower occurrence of Cholelithiasis could be due to anastomosis of jejunum to gall bladder fundus thereby, drainage of gall bladder occurs completely and this prevents gall stasis.

Irregular diarrhea, increased flatus, steatorrhea, hyperoxaluria, including both oxalate stones and interstitial oxalate deposits are some of complications observed in this procedure.

## Conclusion

In spite of classic jejuno-ileal bypass surgery and on the basis of merits of the modified JIB operation, we may conclude that this procedure is greatly effective in reducing excess weight and maintaining weight loss throughout the life with least complications for the patient. Our findings indicate that many of the shortcomings and complications of classic jejunoileal bypass are overcome by this modification and MJIB is a viable option for the morbidly obese patients, especially those willing to eat just as well after operation or those failing gastric bypass. More so, it is well tolerated by high risk obese persons. So, it is an effective and safe treatment for obesity.

## References

Bahrami, H., Sadatsafavi, M., Pourshams, A., Kamangar, F., Nouraei, M., Semnani, S., Brennan, P., Boffetta, R., Malekzadeh, P. 2006. Obesity and hypertension in an Iranian cohort study; Iranian women experience higher rates of obesity and hypertension than American women. *BMC Public Health*, 6: 158.

Das, S.K., Roberts, S.B., Kehayias, J.J., Wang, J., Hsu, L.K., Shikora, S.A., Saltzman, E., McCrory, M.A. 2003. Body composition assessment in extreme obesity and after massive weight loss induced by gastric bypass surgery. *Am. J. Physiol. Endocrinol. Metab.*, 284: E1080–E1088.

Davis, M. 2007. National rates for bariatric surgery on the rise, especially among youth, U-M study finds. Michigan news- University of Michigan. *www.med.umich.edu/opm/.../bariatric.htm*.

Dehkhoda, S., Arian Pour, N., Khameneie, M.K., Roozgar, R. 2012. Surgical site infection prevention by local warming up before operation. *Int. Res. J. Microbiol.*, 3(5): 164–167.

Fazel, I., Pourshams, A., Merat, S., Hemayati, R., Sotoudeh, M., Malekzadeh, R. 2007. Modified Jejunoileal Bypass surgery with biliary diversion for morbid obesity and changes in liver histology during follow-up. *J. Gastrointestinal Surg.*, 11(8): 1033–8.

Friedenberg, R.M. 2002. Obesity. *Radiol*, 225: 629–632.

Gagnon, L.E., Karwacki Sheff, E.J. 2012. Outcomes and complications after bariatric surgery. Five of the most common procedures and nursing implications for pre- and postoperative care. *Am. J. Nurs.*, 112(9).

Gracia, J.A., Martínez, M., Elia, M., Aguilella, V., Royo, P., Jiménez, A., Bielsa, M.A., Arribas, D. 2009. Obesity surgery results depending on technique performed: long-term outcome. *Obes. Surg.*, 19(4): 432–8. doi:10.1007/s11695-008-9762-x.

Johnson, T. Weight loss, dieting & obesity: what about weight loss surgery and bariatric surgery for obesity? - part two. Web Trev.Com Health Services specialist sub-site.

Malekzadeh, R., Mohamadnejad, M., Merat, S., Pourshams, A., Etemadi, A. 2005. Obesity pandemic: an Iranian perspective. *Arch. Iran Med.*, 8: 1–7.

Marceau, P., Hould, F.S., Lebel, S., Marceau, S., Biron, S. 2001. Malabsorptive obesity surgery. *Surg. Clin. North Am.*, 81: 1113–27.

National Institute of Health, 2008. Bethesda: National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), factor for gallstones? Retrieved from: http://win.niddk.nih.gov/publications/gallstones.htm#obesity.

Nguyen, N.T., Varela, J.E., Sabio, A., Naim, J., Stamos, M., Wilson, S.E. 2006. Reduction in prescription medication costs after laparoscopic gastric bypass. *Am. Surg.*, 72(10): 853–6.

O'Brien, P.E., Dixon, J.B. 2003. Clinical obesity. In: The management of obesity: surgery, 2nd edn. Blackwell Published.

Padwal, R.S., Chang, H.J., Klarenbach, S., Sharma, A.M., Majumdar, S.R. 2012. Characteristics of the population eligible for and receiving publicly funded bariatric surgery in Canada. *Int. J. Equity Health*, 11: 54. doi:10.1186/1475-9276-11-54.

Padwal, R.S., Majumdar, S.R., Klarenbach, S., Birch, D.W., Karmali, S., McCargar, L., Fassbender, K., Sharma, A.M. 2010. The Alberta population-based prospective evaluation of the quality of life outcomes and economic impact of bariatric surgery (APPLES) study: background, design and rationale. *BMC Health Serv. Res.*, 10: 284. doi:10.1186/1472-6963-10-284.

Sears, D., Fillmore, G., Bui, M., Rodriguez, J. 2008. Evaluation of gastric bypass patients 1 year after surgery: changes in quality of life and obesity-related conditions. *Obes. Surg.,* 18(12): 1522–5. doi:10.1007/s11695-008-9604.

Shaffer, E.A. 2006. Bariatric surgery: a promising solution for non-alcoholic steatohepatitis in the very obese. *J. Clin. Gastroenterol.,* 40: S44–S50.

Snyder, B., Nguyen, A., Scarbourough, T., Yu, S., Wilson, E. 2009. Comparison of those who succeed in losing significant excessive weight after bariatric surgery and those who fail. *Surg. Endosc.,* 23(10): 2302–6. doi: 10.1007/s00464-008-0322-1.

Vetter, M.L., Cardillo, S., Rickels, M.R., Iqbal, N. 2007. The comparative effects of bariatric surgery on weight and type 2 diabetes. *Obes. Surg.,* 17(9): 1248–56.

Weber, P. Weight-control Information Network. Dieting and gallstones: is obesity a risk?Retrieved from Dr.William.P. Homan's web. Available at: www.obesity help.com /profiles/bariatric-surgeon/dr-philip-weber