

# Surgery for Diabetes

Ileal interposition surgery, a laparoscopic surgery where the segment of terminal ileum along with mesentery is interposed between divided jejunum just distal to duodeno-jejunal junction, is a new hope for type 2 diabetics



Diabetes is known for as long as the mankind.

A disease affecting generations across socio-economic status has affected millions. People have been forced to live a restricted lifestyle and many of them have been handicapped due to associated neuropathy, vision loss, renal failure, cardiac and cerebral vascular episodes. Despite best medication and lifestyle prescriptions, almost 57 per cent of diabetics still have high blood sugar levels, qualifying as uncontrolled diabetic. These people are at high risk of diabetes related co-morbidities.

Worldwide millions die an early death from diabetes related deaths.

Although, rapid concurrent research all over the world has brought to fore many new drugs for diabetes control, the possibility of diabetes resolution is nowhere on the horizon. Stem cell research and pancreatic transplant holds promise for treatment of type 1 diabetes mellitus. Bariatric surgeons performing gastric bypass surgery for over 40 years, on type 2 diabetic obese had noticed significant blood sugar control after surgery. Various reasons were attributed to this incidental observation. This included limitation of food intake, weight loss and impact on gut released hormones called incretins. Individual contribution of each of these factors has never been established. However, meta-analysis published by Henry Buchwald in JAMA in 2004 first time analysed various surgical studies to establish

that over 84 per cent diabetics have resolution of T<sub>2</sub>DM after gastric bypass surgery.

## Suggesting procedures

Based on various other publications, a meeting was called in March 2007, by over 20 national diabetes, nutrition and obesity associations, aptly titled 'Rome Diabetes Surgery Summit' to suggest surgical treatment for diabetes. For thin type 2 diabetic patients, various new and innovative procedures were discussed including duodeno-jejunal bypass and ileal interposition surgery. At the moment, these developmental surgeries are part of clinical research in different countries. The ileal interposition surgery, developed by Dr. Aureo de Paula from Brazil, is based on the hypothesis that in response to food stimulus, distal bowel secretes GLP-1, a hormone into blood circulation. GLP-1 reduces blood sugar levels even in patients with severe cell impairment, stimulates insulin secretion from pancreas, exerts proliferative effect on cells, suppresses glucagon secretion and delays gastric emptying.

In ileal interposition surgery, a segment of terminal ileum along with mesentery is interposed between divided jejunum just distal to duodeno-jejunal junction. The food reaches this interposed ileum within a shorter period after a meal is started. This results in early release of GLP-1 with consequential release of insulin and glycemic control. These patients are thus able to regain acute insulin response, which is lost in diabetics. Post-operation patient is thus able to eat at will, anytime of the day and is expected to maintain lower blood sugar levels.

Ileal interposition surgery is laparoscopically performed and thus entails shorter hospital stay. The results of surgery are better in early diabetics and those with shorter insulin supplementation period. The results of surgery may manifest within one week to three months. The published data shows 70 per cent of selected patients have diabetes remission i.e. have HbA<sub>1c</sub> below six while 14.3 per cent have control i.e. HbA<sub>1c</sub> between six-seven and 15.7 per cent have improvement in diabetes control.

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with HbA1C >seven. Most of patients have better blood sugar levels within 7-10 days even with lower medication requirements. Though it is too early to know the impact of this surgery on improvement of co-morbidities and deaths associated with diabetes, it is a known fact that every one unit reduction of HbA1C results in co-morbidity reduction by 30 per cent and 21 per cent reduction in diabetes related deaths. Over 85 per cent patients are able to maintain HbA1C below seven irrespective of pre-op levels.

### Selection criterion

The selection criterion for inclusion in this study includes adult type 2 uncontrolled diabetics (HbA1C >7.5) on anti-diabetic medication. Usually, patients with high fasting insulin levels and high C Peptide levels respond better to surgical intervention. These tests indicate intrinsic pancreatic function as most of the type 2 diabetic patients have functioning pancreas. Patients on high insulin may be having severe insulin resistance and preserved cell mass. Even these patients are expected to respond favorably after surgery.

Our first patient was suffering from T2DM for over three years and already had diabetic retinopathy and nephropathy. He was on four-five tablets for sugar control but still his sugar levels hovered around 275-300 mgs per cent. He was unable to follow his lifestyle because of progressive weakness. After surgery, his medicine requirement went down and two months later anti-diabetic medication was completely stopped as his fasting level remained around 100-110 mgs per cent and post meal sugar is 120-140 mgs per cent. The results were more significant in our second patient, who was on 85 units insulin and still his blood sugar hovered around 300-400 mgs per cent. He has already lost vision in both eyes due to diabetic retinopathy, had coronary angioplasty and has nephropathy too. Post surgery, insulin was discontinued on the 16th day and he is maintaining blood sugar levels of 70-110 mgs per cent. Third and fourth patients of SGIT were also on high dose of insulin their recovery is closely monitored. Over 300 patients have undergone this procedure with significant diabetes control in over 80 per cent patients.

This surgery is expected to provide answer to many unanswered questions like what factors lead to development of diabetes in some people? What makes diabetes an aggressive disease in some while it remains a gradually progressive disease in others?

It is possible that diagnosis of diabetes is a manifestation of raised blood sugar levels, while patients may be suffering from different diseases.

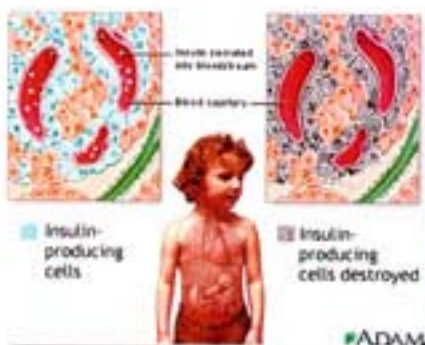


FIG: www.insulin-formation-during-type-2-diabetes-diabetes.blogspot.in

As type 1 and type 2 diabetes are entirely different diseases, it is also possible that within the group of type 2 diabetes, patients may have different etio-pathogenesis or entirely different diseases with one common factor of raised blood sugar level. How else one explains that some patients have significant insulin resistance while others do not, some have early co-morbidities while others do not, some need insulin early while others do not? A re-look at the etio-pathogenesis of diabetes is warranted as SGIT, without interfering with pancreas is able to sustain blood sugar levels. Probably, type 2 diabetes has its origin in an un-connected organ/mechanism and pancreas becomes secondarily affected due to ineffectiveness of secreted insulin.

It is too early to state that surgery will become standard of care for selected group of type 2 diabetes patients. However, one can safely opine that another option is available for possible improved control of type 2 diabetes patients. ■■

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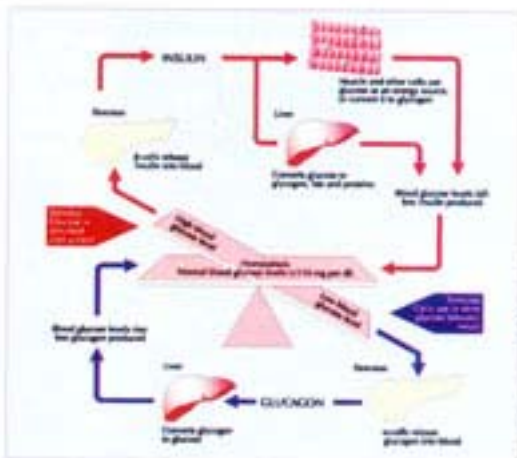


FIG: www.spharmasociety.com

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