METABOLIC SURGERY

Surgical Treatment of Type 2 Diabetes

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SURGICAL REVIEW CORPORATION

WHAT IS SRC ?

SRC (Surgical Review Corporation) is a non-profit, independent, international healthcare organization founded in 2003 in USA and is the administrator of numerous accreditation programs, including metabolic and bariatric surgery. Most important goal of SRC and therefore the accreditation programs run by the corporation is the improvement of healthcare services provided to the patients based on safety, efficiency and efficacy.

COEMBS and SOEMBS programs of SRC are the most prestigious accreditation programs in the world in the field of metabolic and bariatric surgery. SRC is one of the world's leading healthcare institutions which aims to create standards in the field of metabolic and bariatric surgery. With these certificates, our clinic has been integrated with the world's largest metabolic and bariatric database. The statistics obtained from the information stored in this database are accepted as the golden standards in the world.

WHAT IS COEMBS and SOEMBS ?

Over the years, some standards came into existence in the field of metabolic and bariatric surgery with the guidance of rights and wrongs, experience and data. COEMBS (Center of Excellence in Metabolic and Bariatric Surgery) and SOEMBS (Surgeon of Excellence in Metabolic and Bariatric Surgery) are founded upon these standards.

These programs aim to improve and eventually achieve 'Excellency' in healthcare services provided to the patients.

Associate Professor Alper Çelik successfully met all these standards and has been found worthy of "Surgeon of Excellence" accreditation by SRC. With its expert team under the leadership of "Surgeon of Excellence" Alper Çelik and excellent clinical operation, Metabolic Surgery Clinic is one of the finest metabolic and bariatric centers of not only Turkey, but also the world.

METABOLIC SURGERY

■ **Diabetes, commonly known as sugar disease by society, has been increasing world-wide over the last few decades. What treatment have you been applying to cure diabetes? Which diabetes patients benefit from this treatment and who are appropriate candidates for it?**

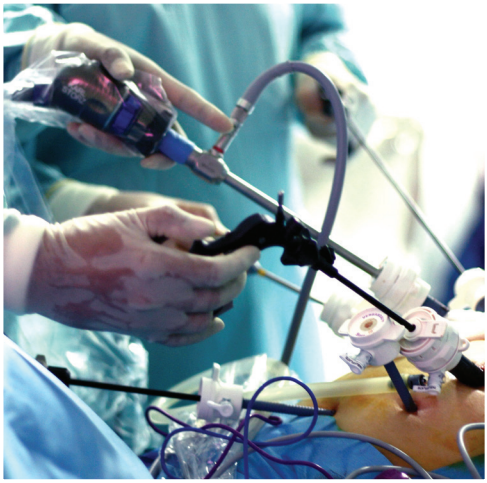
We have been treating type 2 diabetes patients using a surgical method. It is called Metabolic Surgery. The classic treatment paradigm of type 2 diabetes is education, diet, exercise and the use of medication. But the disease may take a progressive course despite all these treatments. Sometimes, even in spite of intensive insulin use, effective results are unobtainable. In such cases Metabolic Surgery should be considered as an effective treatment alternative.

■ **Is this treatment method different for type 1 and type 2 diabetes?**

Of course. Type 1 and type 2 diabetes are completely different diseases. There is no insulin production in type 1 diabetes. On the other hand the body produces insulin in type 2, but cannot use this insulin. We can only help type 2 diabetes patient. That is, we enable the body to use the insulin it already produces.

■ **Is a surgical treatment method needed for type 2 diabetes because the classic treatment methods are not sufficient?**

Type 2 diabetes is a spectrum of heterogeneous and dynamic diseases with many factors. It is a process, where not only hormonal factors, but also neural, psychogenic and environmental factors are involved. The cornerstones of classic treatment are diet and exercise. But few can go on a lifelong exercise regime. The rate of patients who manage to maintain an appropriate diet and do exercises at the required level is not over 5% in any research. And the medical treatments are not able or intended to change the general progress of the disease, but to regulate the



blood sugar from day to day. If we want to fight type 2 diabetes, with the related organ damage and decrease in workforce effectiveness, we need to apply more radical, but no less rational treatments.

■ In this context, is Metabolic Surgery the most radical and rational treatment?

Actually the most radical and rational treatment would be to manipulate the food industry, urban planning and automotive industries. The problem originates from the foods we eat and our modern lifestyle. But at this stage I do not think that anybody, any institution, or even any government can plan such enforced change.

We, the people of the modern age, have not been able to get used to our new food industry and the industrial metropolitan life. The ingredients of the foods we eat have changed within the last 25 years. People living in developed cities have become accustomed to consuming refined, that is, processed foods. When these foods arrive to the medial part of the small intestine, it has been digested already, in a biochemical sense.

What remains is roughage, with much reduced usuable content. Insulin resistance hormones are discharged in the beginning part of the small intestine and the insulin sensitivity hormones from the distal part of the intestine.

As long as the food ingredients coming to the final part of the intestine continue to become poorer in quality, the activity of the sensitivity hormones decreases. We are causing the insulin sensitivity hormones to be activated more effectively by exchanging the beginning and final parts of the small intestine with surgery.

■ How does continuously high levels of blood sugar affect the organs in our body?

Both diabetes types cause organ damage by damaging the blood vessel walls. Organ damage differs according to which

type of vessels in which localization are affected. In patients who are over-weight it particularly affects the medium and large size blood vessels, and accordingly it leads to problems such as heart attack and paralysis. In less weight affected patients it tends to lead to eye, kidney and feet problems as a consequence of its effect on small and medium sized blood vessels. But there are always exceptions.

> **"Metabolic surgery operations are performed laparoscopically, which means they are safer and our patients can return to their daily lives sooner."**

At which stage do you offer surgery?

In type 2 diabetes the medium and large size blood vessel damage starts well before the disease is diagnosed. And it is considered that the majority of patients have a 2-3 year medical history of diabetes before diagnosis. You can understand that there is pre-existing activation of damage to your vessel at the time of diagnosis. Thankfully, type 2 diabetes has a generally moderate rate of progress. That is, most of the complications emerge and progress slowly and silently for years. That's why it is called an "insidious" disease. After studying type 2 diabetes patients over time it is generally accepted that the patient consumes his/her insulin reserve within 10-12 years, and after this period the symptoms of organ damage begin to emerge. This is the time when patients generally apply to us for treatment. Many patients do not want to undergo an operation, especially if everything seems to be fine. So, in summary, in order to help a patient with surgery either he/she must not be able to take his/her blood sugar level under control with medication, or the symptoms of organ damage should have already appeared. Of course, there are many positive benefits to applying this treatment before organ loss occurs and before insulin reserves run out.

You said "if everything seems to be fine". What do you mean?

Many organizations, like the World Health Organization, American Diabetes Association, International Diabetes Federation, have been working to develop management standards for type 2 diabetes. These organizations have detected particular goals for the treatment of type 2 diabetes. However, even with the best treatment combinations only less than %50 of patients can reach the required goals.

What are the results of Metabolic Surgery in this respect?

It is possible to establish control of the disease in over 90% of patients for at least a 10-year-period.

■ **How is the decision to do surgery being made?**

The most important thing to be sure is that the patient has type 2 diabetes. But this alone is not enough.

The patient should have sufficient insulin reserves, and sufficient organ function and activity. Also, the fatty tissue sourced resistance hormones should be positive, and the materials causing damage to the insulin producing cells should be within normal limits.

Of course the most important consideration in deciding on surgery is that the patient should be unable to get the blood sugar or other metabolic syndrome components under control by other means.

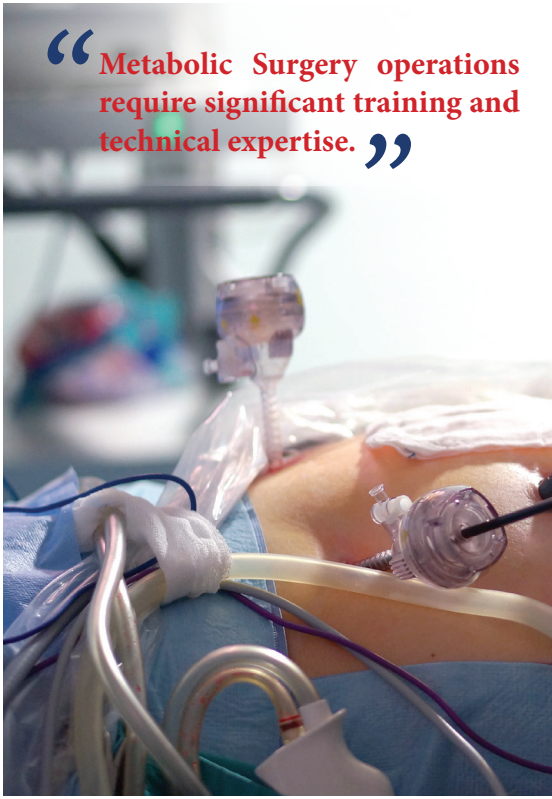
■ **What are the other metabolic syndrome components?**

High blood pressure, obesity, high cholesterol levels and other blood fats.

■ **What is the name of this treatment method and how does the surgery work?**

This method is called lleal Interposition surgery. This application is a procedure involving the stomach, duodenum and small intestine. The left-upper-external part of the stomach is removed, the connection between the stomach and the duodenum is closed off, which slightly alters the stomach's orientation, and the final part of the small intestine is switched with a part from the beginning.

■ **How many patient have you treated with this method till now?**



I have treated about 1400 patients with the Ileal Interposition method in our clinic. The results show that more than 90% of patients can get their blood sugar under control without using any further medicine or insulin.

■ **Do the problems of diabetic patients disappear in the period after the surgery? Does the usage of medicine and insulin end completely? If so, is this period temporary?**

The insulin reserves and organ functionality defines to what extent type 2 diabetes patient benefit from this surgery. The more insulin reserves the patient has

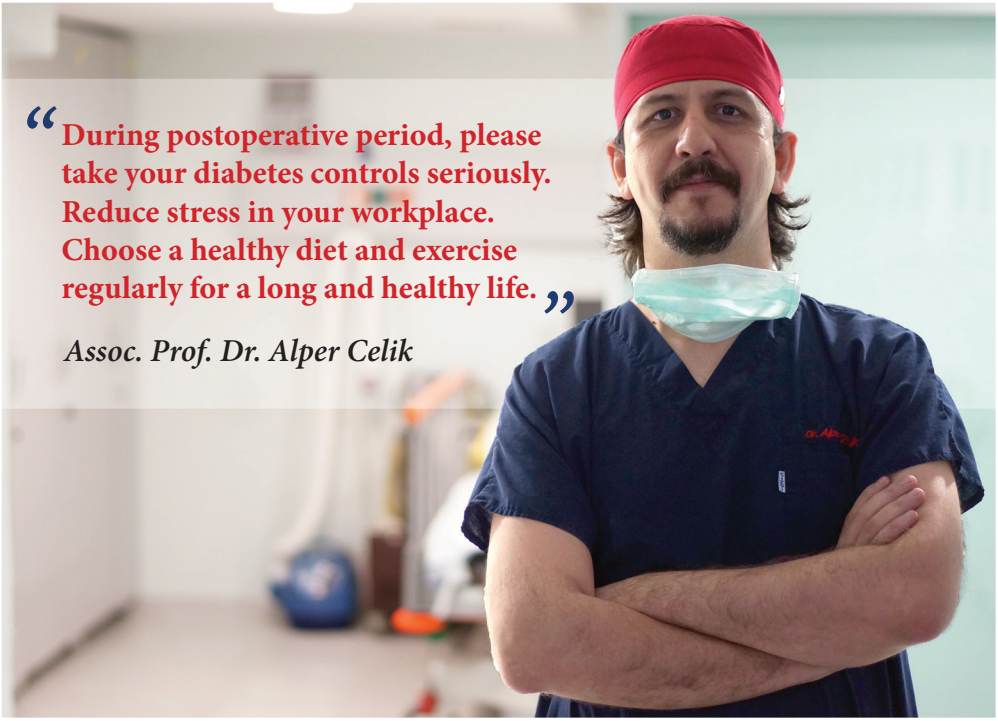
and the higher the organ activity, then the more success can be expected. But the most important point should not be forgotten, which is that diabetes has hormonal, neural and psychogenetic structures. This surgery treats only the hormonal side of diabetes. To explain it simply: when the patient we have provided hormonal control to feels upset for any reason, feels happy or gets angry, there is going to be fluctuations in the level of blood sugar. Actually this kind of fluctuation can be observed in non-diabetic patients too, of course. However, the duration and severity of this fluctuation observed in non-diabetic patients is small-scaled. This fluctuation continues mildly after surgery but becomes normal in a shorter time than before. Type 2 diabetes is a dynamic disease with variable progression over time. The important gauge is the 3-month post operative average blood sugar levels and the state of any organ damage.

■ Is the insulin production of the pancreas enough for nutrition without special diet after surgery, or does the treated patient have to continue on a life-long diet?

The effectiveness of the surgery decreases 10 years after surgery. This is because two natural processes take part. The first one is: we get older. When we get older, our muscle mass and muscle activity decrease.

The second one is: our metabolic rate slows down. This surgery decreases the speed of insulin consumption in the body. Despite this, the function of our insulin reserves will still decrease year by year. The point needing to be stressed here is the decrease in the rate of insulin consumption in the body after surgery. That is, the body uses the insulin reserves more economically. There is not a particular diet after these surgeries.

Actually if the patient is going to go through the effort of following a specialised diet why does he/she undergo surgery (remember, only about 5% of people manage such a diet long-term)? But there are a couple of important nutritional changes after surgery. We can express them as follows:



❍ The patient who has undergone surgery does not feel hunger as much. Their food choices and approaches toward food change.

❍ They eat their food in more modest portions, and this portion makes the patient feel full for a longer time.

❍ The patient cannot physically eat so much as before, even if they want to. But actually they do not want to eat as much food.

■ How is this surgery performed? What is the immediate post-op period like?

This surgery is performed laparoscopically (not open surgery). That is, it is not a long-cut procedure on the abdomen: it is performed through small insertion cuts.

The greatest disadvantage of the surgery is that it is very hard to perform, technically speaking, and it requires very serious training and technical ability.

A couple of hours after surgery the patient starts to drink water. After the patient goes on a liquid diet for 3-4 days, it is possible to slowly start to eat soft vegetable foods.

After about the 6th month patients can eat whatever they want.

■ Are there any side effects of this treatment method? If so, what are they?

We should divide this issue into two

parts, complications emerging during the early term after surgery and complications emerging in the coming years. There are particular complication rates for each kind of surgery and this rate is about 10% for upper digestive system surgeries. This rate is valid for our surgery as well. Among these complications there are bleeding, infection, leakage, and problems related to narcosis. The complication rate among my patients is around 6%. This rate is below the rate of published levels.

There are two potential problems that may be observed in the long term period. One of these is hernia. Hernia on incision lines or internal hernia may develop. The rate of this complication is 1%. The other potential problem is the risk of stone or sludge development in the gallbladder. The rate of this complication is 12%. This rate can be decreased to 5% with preventative medications. But if I observe any signs of of oedema, swelling, or adhesion in my current application, I remove the gallbladder, consequently removing this risk.

What is the difference and advantage-disadvantage compared to the treatment methods applied to obese patients?

Basically, the main purpose of obesity surgery is the control of weight. Sugar control is an incidental result of these operations. Actually, you can take blood sugar levels considerably under control with weight loss in the patient who has been suffering from over-weight problems. On the other hand, the situation is very different and more difficult for patients not on the edge of obesity. Whereas the main problem with obese patients is insulin resistance related to excess fatty tissue, resistance hormones originating from the pancreas, small intestine and liver tissues are the underlying reason of the problem with patients who don't have serious obesity issues. You cannot provide blood sugar control only by weight loss in such cases. For these patients more comprehensive surgery with more than one hormonal goal should be performed. The only surgery that can provide all of these is Ileal Interposition. Besides, the patient should take vitamin and mineral supplements for the rest of their lives after obesity surgery. However after Ileal Interposition patients do not need vitamin or mineral supplements after one year. They live a completely free life.

How long does it take for your patients to return to their daily lives after this surgery?

The initial 3 to 4 weeks after surgery is the period adaptation to the changes. In this period the body tries to get used to its new metabolism. Fluctuations happen in the levels of blood sugar and blood pressure. In this period the patient may feel tired and moody. The most important point to be stressed here is that the recovery period after surgery shows a very individual progress for diabetics. There are a couple of factors defining healing after surgery. Male patients compared to female, young patients compared to old, show rapid improvements. Of course, the length of time diabetes

has been present, how it has progressed, the existence of organ damage and its severity, are very important factors in the recovery period.

Generally, the body gets used to its new metabolism after 3 to 4 weeks and the patient starts to feel better. About 2 to 2 and a half months after surgery the patient will have started a new life. Energy levels and daily activities gradually increase and sleeping becomes regular.

The patient wakes rested and refreshed in the mornings. The life after this period seems miraculous. We suggest in this period that the patient should not allow themselves to get hungry or thirsty, he/she should take supplementary medicines and vitamins, and would benefit from a walk for 15-20 minutes every day. The need for medicine and vitamins decrease gradually, and the majority of our patients stop taking these suplements within 6 months after surgery. Moreover, we have been applying daily, weekly and monthly follow-up programme.

All of the patients who had surgery in Metabolic Surgery Unit gather every year in autumn.

■ Are there any permanent problems for patients returning to their daily life? If so, what are they?

The patient should get used to new eating behaviour after surgery. They should live on more modest portions, and eat more often. This is the suggestion that any diabetic patient has heard from every doctor, however this condition spontaneously develops after the surgery. But this new eating behaviour takes time for patients to get used to. During the initial 3 to 4 months adaptation period patients may have diarrhea-like symptoms. These symptoms are temporary and won't be a problem so long as the condition of the patient is followed up and the proper treatment is applied.

■ Where did this surgery begin and for how long has it been performed?

The site of origin of this surgery is Brazil. Brazilian surgeon Aureo De Paula brought this application to world medical literature.

It is being performed since 1999.

■ In which other countries has this treatment method been applied? How are the results in these countries?

This application is being performed by 8 surgeons in 6 countries around the world. The overall results show that control of over 90% of metabolic syndrome components has been achieved.

■ Do you share information with your colleagues applying this treatment method?

There is an organization named GASRD (Global Association for Surgical Treatment and Research on Diabetes). We have been sharing data within this organization. Additionally we attend and present at the annual and biannual international meetings of many medical organizations.

■ The diabetes disease has in recent times increased in our country and in the European Union. According to the research it is understood that the rate of diabetic patients is up to 15%. As far as we understand, the method you are applying is a long term and effective treatment of type 2 diabetes. Are there any meetings or conferences to discuss this treatment method with your European colleagues and to explain it to a greater circle? If there will be, where and when will they be?

I have been attending domestic and overseas meetings and organizations almost every month and explaining this treatment method. In the last two years I attended meetings in Japan, India (Hyderabad and New Delhi), Singapore, Germany (Hamburg and Frankfurt), Spain (Malaga and Barcelona) and 6 meetings in Turkey. I have made presentations and given speeches. I have started to write a book about this issue, to train new surgeons, and to organize about 15 websites. And I will continue to explain this process and it's benefits as long as I live. I have devoted myself to this matter.

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