Metabolic and Bariatric surgery: China Concept

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Bariatric Surgery

New Insights
Evolution of Bariatric Surgery in China

◆ 1982 First reported
◆ 2000 Started laparoscopic bariatric surgery
◆ 2006 Attributed to endocrine surgery
◆ 2012 Became an emerging discipline: Metabolic & bariatric surgery
Eligibility of Bariatric Surgery in Western Countries

- BMI $\geq 40\text{kg/m}^2$
- BMI $\geq 35\text{kg/m}^2$, with comorbidities
- Failed to traditional intervention
- Exclude obesity secondary to other endocrine diseases
- Psychological and mental stability

—March 1991, NIH Consensus Development Panel
"Apple" vs. "Pear"

Above the waist

Below the waist
Eligibility of Bariatric Surgery in Asian Pacific Countries

- BMI $\geq 37$ kg/m$^2$
- BMI $> 32$ kg/m$^2$, with diabetes or $\geq 2$ comorbidities
- Failed to traditional intervention
- Exclude obesity secondary to other endocrine diseases
- Psychological and mental stability

—February 2005, 1st Asia-Pacific Bariatric Consensus Meeting
可能涉及多个不同的临床学科参与，建议手术应在相当二级或以上的综合性医疗机构开展。术者应为具有高年资中级或以上职称的普外科医生，熟悉胃部解剖且有胃手术的经验。开展此类腹腔镜手术的医生还应熟练掌握腹腔镜操作技术，具有腹腔镜胃肠手术经验。所有医生必须经过专项培训或临床指导后方可独立施行此类手术。不同的医生可能采用不同的手术方法，目前仍在努力设法对特定病人确定最佳的手术方案。但到目前为止，还只能说明我们可以推选上述几种相关方法中由其会有效的方法供选择。经验表明，
Metabolic syndrome, including diabetes, cardiovascular disease, NASH, dyslipidemia, sleep apnea, etc. caused by excessive adipose tissue, & it is predicted bariatric surgery is beneficial to these conditions.
Obesity comorbidities are more life-threatening than obesity itself.

Comorbidities usually improves before significant weight loss

Outcome endpoints should include improvement or remission of comorbidities
• 2008 American Society for Bariatric Surgery changed its name to American Society for **Metabolic** & Bariatric Surgery

• 2009 Bariatric Surgery was renamed **Metabolic** & Bariatric Surgery, clinically
Metabolic Surgery

Outcomes of Metabolic Syndrome
Addition of Surgical treatment of T2DM:

... ... Laparoscopic bariatric surgery (including LAGB and LRYGB): commonly performed with the least complications.

... ... is recommended: 
- BMI ≥ 35 kg/m²; or
- BMI 32-34.9 kg/m² + HbA1c ≥ 7%; age between 18 to 60; T2DM history ≤ 5 years; negative in IAA test; C-Peptide ≥ 0.3 mg/L; no other contraindications

“Chinese Guidance of Type 2 Diabetes Prevention and Treatment” revised in 2010 2010.11.18
Diabetic Surgery

Surgery Treatment for Type 2 Diabetes Mellitus
Some gastrointestinal surgical procedures, including standard performed bariatric procedures and several new unproven weight loss procedures turn to be effective in type 2 diabetes control, and even complete remission in many cases. During the first few days or weeks after the surgery, the patients' type 2 diabetes become under controlled, which happens much earlier than the actual weight loss. Studies indicate that such outcome can not be explained by reduction of food intake and body weight.
Indications for Surgical Treatments of Type 2 Diabetes

• A large number of cases show surgeries could cure type 2 diabetes and reduced diabetes related mortality. From these evidences, we consider to broaden the surgical indications for some diabetes patients although they might not reach the BMI eligibility for bariatric surgeries.
**Argument**

**The Affirmative**
- Effectiveness for T2DM Treatment
- Lower mortality and complications
- Small incision under laparoscopy

**The Negative**
- Without clear mechanism for T2DM remission
- Need more standards of the acceptance level
- Lack of enough sample size, RCT research and long term follow-up
Chinese Guidance on surgical treatment of diabetes

中国糖尿病外科治疗专家指导意见(2010)

中华医学会外科学分会内分泌外科学组
中华医学会外科学分会胃肠外科学组
中华医学会外科学分会外科手术学学组
中华医学会外科学分会腔镜与内镜外科学组

【关键词】肥胖症;2型糖尿病;胃肠外科手术
Keywords obesity; type 2 diabetes mellitus; gastrointestinal surgery

本指导意见中所指的糖尿病外科治疗只针对2型糖尿病(type 2 diabetes mellitus, T2DM), 即在胰岛素抵抗的基础上进行性的胰岛素缺乏所致的糖尿病。

本指导意见中所指的外科治疗特指以限制食物摄入、减少食物吸收为目的的胃肠外科手术, 主要包括“Y”型胃肠短路术(Roux-en-Y Gastric Bypass, RYGB)、改良简易型胃肠短路术(Mini Gastric Bypass, MGB)、胆胰吻合术(Biliopancreatic Diversion, BPD) 或十二指肠转位术(Biliopancreatic Diversion with Duodenal Switch, BPD-DS)、管状胃切除术(Sleeve Gastrectomy, SG) 和可调节胃带带术(Adjustable Gastric Banding, AGB)。根本上阻止糖尿病各种并发症的发生和发展。严格的饮食控制和反复的血糖水平波动对病人造成持续精神压力，并影响着生活质量。病人迫切需要一种能良好控制糖尿病及其并发症的治疗手段。

糖尿病通常与肥胖并存，约90%的T2DM病人肥胖或是体重超重。近年来随着减肥外科在国内外的蓬勃发展，越来越多的肥胖病人接受减肥外科手术,并取得了良好的减重效果。然而,令人惊奇的是,这些减肥手术在有效减轻人体体重的同时,也有效的改善了大部分病人并存的血糖代谢紊乱[3]。在接受外科手术后，一些肥胖病人术前所并存的糖尿病得到临床缓解甚至是临床完全缓解[4~6]。
Indications for Surgical Treatments of Type 2 Diabetes

• For T2DM patients, gastrointestinal bariatric surgery can be considered if failed to the traditional treatment
Indications for Surgical Treatments of Type 2 Diabetes

• (1) For super obese patients: Surgery must be a superb choice which causes weight loss and diabetes improvement.

• (2) For mild and moderate obese patients: BMI≥27.5 with type 2 diabetes, we recommend surgical treatment which is aligned with our eligibility standard.

• (3) For normal and over weight patients, with initial data show preferable outcome in diabetes treatment. But this practice is still investigational and awaiting additional outcome and safety evidences
1. LRYGB

旷置近端空肠

空肠Roux袢
2. LSG
3. LAGB
Risks and Efficacy

Surgery Efficacy

- LRYGB
- LMGB
- LSG
- LAGB

Surgery Safety

- LAGB
- LSG
- LMGB
- LRYGB
Diabetes can affect the healing of the surgical incision, increase the infection probability, raise the incidence of surgical complications and perioperative risks. Such risks can be even greater when the patient has metabolic syndromes such as obesity, hyperlipidemia and hypertension. We need fully prepared and give a fair evaluation whether the patient is suitable for a surgery or not. Besides, most of the surgeries can be done under laparoscopy with small incisions, less bleeding, fast recovery and lower risks. So laparoscopic procedures are recommended over open procedures.
Laparoscopic Surgery
Single Port Access
Laparoscopic Surgery
N.O.T.E.S.
Sir George Alberti, Co-chairman and Senior Researcher of Imperial College London, pointed out that metabolic surgery is a viable and low cost treatment for obese type 2 diabetes patients with low risks. It should become the early phase treatment option for super obese patients instead of the last option. It also should be included in the treatment algorithm of type 2 diabetes. He also mentioned that because of the higher risks of diabetes and cardiovascular diseases in Asian patients, the threshold of eligibility of surgery should be lowered.
1.5 Except of changing the living way and medical treatment, gastrointestinal surgery for fatal obesity (metabolic surgery) is also an effective way for obesity patients to ease diabetes. Metabolic surgery may have the patient's blood glucose return to normal, reduce or avoid medication which is a potential cost efficient treatment.

1.6 Metabolic surgery is for type 2 diabetes patients with obesity and failed to get cured by medication, especially for those with severe complications.

1.7 Surgery should be the choice of type 2 diabetes patients with BMI ≥ 35.

1.8 Surgery should be the choice of patients with BMI between 30 - 35 who want to get a better control of the diabetes, especially those who have severe cardiovascular disease risks.

1.9 The surgery acceptance level could be lower 2.5 kg/m² for Asian and other high-risk take patients.

1.14 The complication rate and death rate of metabolic surgery is very low, which is similar to regular surgeries like selective bladder gall surgery and gallstone surgery.
Diabetes Progression

N Engl J MED, Volume 347:1342-1349 oct 24, 2002 Number 17, David M. N, M.D.
End Diabetes Progression with Surgery

CLINICAL PRACTICE

Surgery

Year

Usual Sequence of Interventions

Risk factors for cardiovascular disease

Usual Course

Typical Clinical Course

Impaired glucose tolerance and insulin resistance

Development of diabetes

Diagnosis of diabetes

Microvascular complications

Combination therapy with oral agents

More advanced microvascular and cardiovascular disease

Insulin

More advanced disease

Death

Chinese Consensus on Surgical Treatment of T2DM
手术治疗糖尿病专家共识
Chinese Diabetes Association & Chinese Surgical Association
中华医学会糖尿病学分会, 中华医学会外科学分会

1 前言
随着社会的不断发展和人们生活方式的改变, 糖尿病已成一种“流行病”, 在世界各地蔓延开来。据2007-2008年中华医学会糖尿病学分会“中国糖尿病和代谢综合征研究组”的调查显示, 我国20岁以上人群中男性和女性糖尿病的患病率分别达10.6%和8.8%, 总体患病率已达9.7%, 而糖尿病前期的患病率更是高达15.5%, 据此可推算我国糖尿病患病总人数已达9240万, 糖尿病前期人数

的平衡, 从而为肥胖糖尿病病人本人和社会减轻经济上的负担。3-10]

在众多的减肥手术中, 胃旁路手术 (gastric bypass, GBP) 研究较早且较多, 对伴肥胖症的T2DM病人治疗效果最好。一项来自香港的报告, 采取前瞻性队列研究11, 2002年7月至2007年12月期间应用腹腔镜可调节胃束带术 (LAGB) 57例, 腹腔镜胃袖套状切除术 (LSC) 30例以及腹腔
镜胃旁路手术 (LGB) 7例治疗病态肥胖症, 术后2年, 病人
Chinese diabetes prevalence update: 9.7% adults (> 20yr) are diabetic. China might have the largest number of diabetic patients among all countries in the world.
Chinese Consensus on Surgical Treatment of T2DM has been publically promoted

健康报

HEALTH NEWS

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7月21日至24日，2011中国医师协会内分泌代谢科医师分会年会暨第三届亚洲糖尿病学会年会在京举行。中华医学会糖尿病学会分会主任委员纪立农教授指出，外科手术作为治疗糖尿病的方法之一，已成为业界共识。但伴随胰腺切除术的同时，术后随访，从而确保手术疗效是目前急需关注的问题。

据介绍，美国一项全球最大的糖尿病外科手术荟萃分析对16944名患者进行了分析研究，结果显示，77%的患者在经过胃肠手术后，糖尿病得到完全或部分缓解。为此，今年4月，世界糖尿病联盟正式发表声明，认为减重手术可作为治疗2型糖尿病的手段之一，并推荐早期进行干预。今年7月，中华医学会糖尿病学会分会与中华医学会外科学分会共同发布手术治疗糖尿病专家共识。

共识明确提出适合减重2型糖尿病患者的6种适应症，包括体重指数（BMI）大于36；BMI在35时，生活方式和药物治疗难以控制血糖或开发出具有心血管风险。BMI为28～29.9时，有骨性（女性腰围大于85厘米，男性大于90厘米），且至体重代谢综合征标准（高甘油三酯、低密度脂蛋白水平、高血压）；患者年龄在60岁以下等。

该共识的第一执笔人、第二军医大学长海医院内分泌科主任邹大进教授说，虽然减重手术风险很一般，但包括肠梗阻、吻合口漏、肺栓塞、深静脉血栓、胃等在内的术后近，远期并发症仍然存在，规范化的限制不容忽视。应确保具有内分泌专业

规范操作是当前首要工作
Key Points

• Both endocrinologists and bariatric surgeons agree that bariatric surgery can be an option for diabetes treatment.
• Understanding the surgery eligibilities and its evolution
• To all obese type 2 diabetic patients
• Some specific signs of diabetes make it more suitable for surgery
• The choice of surgical procedure and standard of procedures
• Form clinic pathways in both internal medicine and surgery
LRYGB

旷置近端空肠

空肠Roux袢
Original article

International Sleeve Gastrectomy Expert Panel Consensus Statement: best practice guidelines based on experience of >12,000 cases


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Abstract

Background: Laparoscopic sleeve gastrectomy (LSG) is an emerging surgical approach, but one that has seen a surge in popularity because of its perceived technical simplicity, feasibility, and good outcomes. An international expert panel was convened in Coral Gables, Florida on March 25 and 26, 2011, with the purpose of providing best practice guidelines through consensus regarding the performance of LSG. The panel comprised 24 centers and represented 11 countries, spanning all major regions of the world and all 6 populated continents, with a collective experience of >12,000 cases. It was thought prudent to hold an expert consensus meeting of some of the surgeons across the globe who have performed the largest volume of cases to discuss and provide consensus on the indications, contraindications, and procedural aspects of LSG. The panel undertook this consensus effort to help the surgical community improve the efficacy, lower the complication rates, and move toward adoption of standardized techniques and measures. The meeting took place at on-site meeting facilities, Biltmore Hotel, Coral Gables, Florida.

Methods: Expert panelists were invited to participate according to their publications, knowledge and experience, and identification as surgeons who had performed >500 cases. The topics for consensus encompassed patient selection, contraindications, surgical technique, and the prevention and management of complications. The responses were calculated and defined as achieving consensus (≥70% agreement) or no consensus (<70% agreement).

Results: Full consensus was obtained for the essential aspects of the indications and contraindications, surgical technique, management, and prevention of complications. Consensus was achieved for 69 key questions.

Conclusion: The present consensus report represents the best practice guidelines for the performance of LSG, with recommendations in the 3 aforementioned areas. This report and its findings support a first effort toward the standardization of techniques and adoption of working recommendations formulated according to expert experience. (Surg Obes Relat Dis 2012;8:8–19.) © 2012 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords: Consensus statement; Laparoscopic sleeve gastrectomy; International Sleeve Gastrectomy Expert Panel; Morbid obesity; Bariatric surgery; Outcomes
糖尿病患者
内科诊断明确诊断

1型糖尿病 2型糖尿病 其它特殊类型糖尿病
内科治疗

BMI < 24
BMI ≥ 28

能够控制血糖稳定 有效控制各种合并症
伴有明显的合并症 且无法有效控制
不能耐受内科治疗
继续内科治疗

BMI ≥ 28
BMI ≥ 28

年龄 > 60 岁 病程 < 15 年
年龄 ≤ 60 岁 病程 ≥ 15 年

内科治疗

血糖控制效果不佳
在伦理委员会批准的程序下进行外科治疗

继续内科治疗

治疗效果良好
继续内科治疗

倘若非可以耐受治疗

治疗效果不佳
继续内科治疗

外科治疗

有明显的合并症
尤其是心血管高危因素

无明显的合并症

男腰围 < 90cm 女腰围 < 80cm
男腰围 ≥ 90cm 女腰围 ≥ 80cm

内科治疗

外科治疗

外科治疗

外科治疗

注：合并症主要包括高血压、血脂异常等等。
内科治疗指饮食调整、运动锻炼、药物治疗等非手术疗法。
外科治疗包括RYGBP、MGBP、SG、AGB等手术方法。所有手术治疗均要在患者条件允许的情况下进行，诸如严重吸血功能障碍疾病、心肺功能不全等不能耐受手术者，一律列为手术禁忌。
The Diabetes Surgery Summit Consensus Conference

Recommendations for the Evaluation and Use of Gastrointestinal Surgery to Treat Type 2 Diabetes Mellitus

Francesco Rubino, MD,*† Lee M. Kaplan, MD, PhD,‡ Philip R. Schauer, MD,§ and David E. Cummings, MD,¶ on behalf of the Diabetes Surgery Summit Delegates

目的: 为应用胃肠外科手术治疗2型糖尿病制订指南，并为将来进一步的研究作出规划。

背景: 越来越多的证据表明，减肥手术可以显著改善2型糖尿病。不出所料，全世界都正在应用胃肠外科手术治疗肥胖症合并的糖

2008年9月纽约举行的第一届“全球2型糖尿病治疗大会”上由若干学术团体的代表正式讨论研究。根据讨论的结果制订了现在的最

结果: DSS意见主要包含了对于临床及研究方面的建议，还有
Can all the diabetic patient eligible for bariatric surgery?

Pancreatic β-cell function:
• 50% of pancreatic β-cell function diminished when first diagnosis of type 2 diabetes.
• β-cell function gradually fails over time
• The longer the history of diabetes, the worse β-cell function.
• Life span of β-cell is about 60 days, 0.5% of total β-cell become apoptic each day
• Earlier stage of diabetes is partially reversible. It becomes irreversible at the late stage
Can all the diabetic patient eligible for bariatric surgery?

<table>
<thead>
<tr>
<th>T1DM</th>
<th>T2MD</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>95%</td>
</tr>
<tr>
<td>Youth or age &lt; 40</td>
<td>Elderly</td>
</tr>
<tr>
<td>Obvious symptoms</td>
<td>Symptoms not obvious</td>
</tr>
<tr>
<td>Less and mild complications</td>
<td>More and severe complications</td>
</tr>
<tr>
<td>Anti-Hyperglycemic medication doesn't work</td>
<td>Anti-Hyperglycemic medication works</td>
</tr>
<tr>
<td>Body weight normal or underweight</td>
<td>Mostly obese</td>
</tr>
</tbody>
</table>
Can all the diabetic patient eligible for bariatric surgery?

- Exceptions
- Current Facts
- Clinical examinations
- Degree of Pancreatic β-cell loss
- Mechanism of Treatment
- Length of Diabetes
Can all the diabetic patient eligible for bariatric surgery?

Age
Degree of Life-threatening
Years with Complications
Related to pancreatic dysfunction?
Cost / benefit ratio?
Can all the diabetes treated by surgery?

BMI
Acknowledge
Treatment Effectiveness
Understanding
Standardize Operations
Medical Ethics
论著（摘要）

根据减重结果纵向数据库报告的ASMBS减重手术中心参与的优秀项目，代谢性手术治疗糖尿病的早期术后结果

Early Postoperative Outcomes of Metabolic Surgery to Treat Diabetes From Sites Participating in the ASMBS Bariatric Surgery Center of Excellence Program as Reported in the Bariatric Outcomes Longitudinal Database

Eric J. DeMaria, MD,* Deborah A. Winegar, PhD,† Virginia W. Pate, MS,‡ Neil E. Hutcher, MD,‡ Jaime Ponce, MD,§ and Walter J. Pories, MD¶

目的：小型系列研究显示，减重手术是未达病态肥胖体重标准[体重指数（BMI）<35 kg/m²]的2型糖尿病患者的有效治疗方法，但是尚无有关评价安全性和有效性的大型多机构研究。

方法：在减重结果纵向数据库中，2007年6月至2009年6月共有66,264例知情同意并首次行减重手术的患者，挑选30 kg/m²≤BMI <35 kg/m² (1.2%，n = 794) 并需要药物治疗的糖尿病患者（29%）。

结果：共有235例患者符合入选标准。比较最常见的2项手术，即可调节胃束带术（n=109）和胃旁路手术（n=109）发现，腹腔镜手术占92%；性别（女性76.6%）、种族（白种人80.4%）和年龄（平均年龄52.6±10.4岁）均无组间差异。与可调节胃束带术相比，胃旁路手术的减重效果和缓解糖尿病的效果更好，但并发症率较高（90天并发症率：18% vs. 3%，P<0.05）。无死亡病例报道，且大多并发症为轻度。
G58. 体重指数 23~35 的 2 型糖尿病患者胆汁胰液改道术的效果

Effects of Biliopancreatic Diversion on Type 2 Diabetes in Patients With BMI 25 to 35
Scopinaro, Nicola; Adami, Giovanni F.; Papadia, Francesco S.; Camerini, Giovanni; Carlini, Flavia; Fried, Martin; Briatore, Lucia; D’Alessandro, Gabriele; Andraghetti, Gabriella; Cordera, Renzo

目的：解决胆汁胰液改道（BPD）解决几乎全部的病态肥胖 2 型糖尿病患者BMI（体重指数）
≥35 kg/m²]。然而，胆汁胰液改道效果研究BMI范围在 25.0~34.9 kg/m²，包括大约 90%的糖
尿病患者尚缺乏。

材料和方法：如果BPD效应不依赖于体重变化时，在有轻微肥胖或超重患者，术后将会减少
很少或者不减少体重。30 例体重指数（BMI）在 25~34.9 kg/m²的 2 型糖尿病患者行BPD并
监测 12 个月。38 例糖尿病患者选取自一个大型数据库,保持 1 年的医学治疗作为对照。

结果：19 个男性和 11 个女性。平均年龄 56.4±7.4 岁，体重 84.8±11.1 kg，体重指数（BMI）
的 30.6±2.9 kg/m²，腰围 104±9.4 cm，糖尿病病程 11.2 ±6.9 年，糖化血红蛋白HbA1c 9.3±1.5。
D5. 非肥胖 2 型糖尿病患者代谢手术：肠促胰岛素，脂肪细胞，胰岛素分泌/抵抗变化的 1 年期临床对照研究

**Metabolic Surgery for Non-Obese Type 2 Diabetes: Incretins, Adipocytokines, and Insulin Secretion/Resistance Changes in a 1-Year Interventional Clinical Controlled Study**

Golomber, Bruno; Golomber, Sylvia; Rodovilho; Chairi, Elinton; Hirsch, Penne de Pilgueira; Felice, Alan Claudia; Lambert, Glâ; de Sambassia, Marcus Antonio; Parreira, José Carlos.


目的：比较非肥胖 2 型糖尿病患者十二指肠空肠搭桥（DIB）术与标准治疗及评价手术引起的内分泌和代谢的变化。

方法：符合下列条件的 18 名患者进行了 DIB：超重，糖尿病的诊断时间低于 15 年，目前胰岛素治疗，存在剩余 β 细胞功能，无自身免疫性疾病。患者拒绝手术治疗接受标准治疗（对照组）。手术后第 1，3，6，和 12 个月进行葡萄糖耐量试验，评估胰岛素的敏感性，餐后血糖
Remission of Type 2 Diabetes After Gastric Bypass and Banding: Mechanisms and 2 Year Outcomes

Pournaras, Dimitrios J.; Osborne, Alan; Hawkins, Simon C.; Vincent, Royce P.; Mahon, David; Ewings, Paul; Ghatei, Mohammad A.; Bloom, Stephen R.; Welbourn, Richard; le Roux, Carel W.

目的：探讨胃旁路术和束带术后2型糖尿病缓解率并确定减重手术后2型糖尿病缓解机制。
背景资料概述：减重手术后2型糖尿病患者的血糖控制改善。
方法：研究1中，34例2型糖尿病肥胖患者进行胃旁路术或束带术并随访36个月。糖尿病缓解定义为患者不再需要降糖药物治疗，空腹血糖<7 mmol/L，口服糖耐量试验2 h 血糖<11.1 mmol/L，糖化血红蛋白（HbA1c）<6%。研究2中，41例2型糖尿病肥胖患者或进行胃旁路术，或进行胃束带术，或极低热量饮食，随访42天。测量标准餐后的胰岛素抵抗（HOMA-IR）、胰岛素生成和胰高血糖素样肽1（GLP-1）应答。

背景：LSG 是一种新型的技术，且使用率日渐增多。然而，目前仍然缺乏 LSG 与其他手术
糖尿病手术治疗 别让好苗长歪了

近年来，国内开展糖尿病手术治疗的医院机构越来越多，出现了各种不同的手术治疗方法。在前期的报道中，我们曾提及了糖尿病外科手术的原理和效果，但手术治疗糖尿病的风险和效果如何？手术治疗糖尿病的适宜人群和禁忌症如何？这些问题一直困扰着广大糖尿病患者。在此，我们再次提醒各位糖尿病患者和医生，手术治疗糖尿病并非万能，患者在选择手术治疗前，要充分了解手术治疗的利弊，避免手术治疗带来的风险。

安全性与有效性得到认可
手术治疗糖尿病的主要机理是通过外科手术对胃肠道结构进行“塑型”改变，从而限制食物摄入和吸收，减少食物对胰岛素的负担。另外，手术可以有效地改变血糖控制，引起胰岛素敏感度的改善，从而降低糖尿病的风险。

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专家指出，手术治疗糖尿病并不适合所有糖尿病患者，对于肥胖型糖尿病患者来说，手术治疗可能是首选。对于1型糖尿病患者，手术治疗可能不适合。对于2型糖尿病患者，手术治疗可能是一个辅助手段。手术治疗糖尿病的适宜人群是：BMI指数＞30，身高体重指数＞30，或有明显体重下降的患者。

【患者故事】
张先生，45岁，BMI指数38，身高170cm，体重120kg。经过药物治疗和生活方式的调整，病情没有得到明显改善。医生建议他进行手术治疗。张先生经过反复考虑，最终决定接受手术治疗。手术后，张先生的体重显著下降，血糖控制也得到了改善。

【医生评价】
手术治疗糖尿病的效果因人而异，对于一些特定的糖尿病患者，手术治疗可能是一种有效的治疗手段。但是，手术治疗糖尿病也有一定的风险和并发症，患者在选择手术治疗前，要充分了解手术治疗的利弊，避免手术治疗带来的风险。
http://www.weight-loss.org.cn

手术减肥网
WEIGHT LOSS SURGERY

首页 关于肥胖症 关于减肥手术 关于可调胃束带减肥手术 付诸行动 经验分享 资源下载 减肥论坛

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登录 用户名 密码 记住我 忘记密码

减肥手术改善您的生活
一个有效的减肥手术应该达到持续的减肥效果，并且能降低可能发生的相关健康问题或严重疾病的危险性，提高患者的生活质量。

查找手术中心： 上海
第二军医大学附属长海医院 肥胖中心
医生：洪成竹 主任
地址：上海市长海路174号

你知道什么是肥胖症吗？
你知道肥胖症带来的危害吗？
你知道各种外科减肥手术吗？
你知道可调胃束带手术SAGB吗？
决定如何摆脱过重的困扰了吗？
或是你有听听别人是怎么说的？

Thank You！
1. Why was the eligibility of bariatric surgery revised in recent years in China?
   a) Chinese people are becoming leaner and leaner
   b) Based upon accumulated clinical evidence and new insights into metabolic surgery
   c) More and more low BMI T2DM patients request such surgery
   d) Medical insurance encourage T2DM to accept bariatric surgery

2. Which of the following statement is true?
   a) BMI is the single most critical factor when deciding bariatric surgery eligibility
   b) According to the current available initial clinical data, some types of bariatric surgery also seems effective in remission of T2DM in low BMI patients
   c) Metabolic surgery should be recommended to all T2DM patients, regardless of the status of pancreatic beta cell function
   d) Bariatric surgery outcome assessment should NOT include metabolic endpoints, such as diabetes remission, etc.

Answers: 1. b); 2. b)