

## 内镜下袖状胃成形术治疗肥胖与代谢病的研究进展

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**【摘要】** 肥胖症严重威胁着人类的健康, 减重手术作为病态肥胖患者安全有效的治疗方法, 尽管疗效已得到证实, 但其手术风险和高昂的医疗成本限制了其在临床的应用和普及。内镜下袖状胃成形术(ESG)作为一种相对新的内镜减重手术技术, 与腹腔镜袖状胃切除术相比, ESG在减重方面具有令人满意的效果, 而且保留了胃的正常结构, 且已经在国外多中心研究得到验证。但目前国内尚未广泛开展 ESG, 但随着这一术式的逐渐成熟, 其前景值得减重领域同仁关注。未来国内也亟待开展大规模、长期、多中心的研究来明确, ESG手术在中国肥胖与代谢病患者中的远期效果、合并症缓解以及并发症发生情况。

**【关键词】** 肥胖; 减重手术; 内镜下袖状胃成形术; 腹腔镜袖状胃成形术

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### Advances in endoscopic sleeve gastroplasty for the treatment of obesity and metabolic disease

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**【Abstract】** Obesity poses a serious threat to human health, and although bariatric surgery has been proven effective treatment for morbidly obese patients, its surgical risks and high medical costs limit its clinical application and popularity. Endoscopic sleeve gastroplasty (ESG), as a relatively new endoscopic surgery technique for weight loss, has satisfactory weight loss effects compared to laparoscopic sleeve gastrectomy and lifestyle interventions, while preserving the normal structure of the stomach. Its weight loss effects and safety have been validated in multicenter studies abroad. Although, ESG has not yet been widely performed in China, with the gradual maturity of this technique, its prospects are worth attention in the field of weight loss. In the future, large-scale, long-term, multi-center studies are urgently needed in China to clarify the long-term effects, remission of comorbidities, and occurrence of complications of ESG surgery in obese and metabolic disease patients.

**【Key words】** Obesity; Bariatric surgery; Endoscopic sleeve gastroplasty; Laparoscopic sleeve gastroplasty

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肥胖症是脂肪在体内过度堆积, 造成的一系列病理生理改变, 已成为一种流行病。按照绝对人口数来计算, 2020年全国已有6亿人超重和肥胖, 达到全球第一<sup>[1]</sup>。虽然

包括生活方式改变、体育锻炼和药物治疗在内的非手术方式, 可以带来一定程度的体质量减轻, 但这些方法容易反弹, 对于重度肥胖的患者效果不佳<sup>[2]</sup>。目前, 减重手术是治

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疗肥胖和并发症的最有效且持久的方式<sup>[3,4]</sup>。但是实际上接受减重手术的患者只占少部分,其原因主要包括如下两方面:(1)虽然减重手术能带来益处,但由于不可逆,且有并发症发生风险,出于担忧,只有不到2%的患者接受了减重手术<sup>[5-8]</sup>;(2)因为手术的费用、医保和家属反对,以及患者自身等原因而未能接受减重手术<sup>[9]</sup>。因此,如果有一种方法既能达到腹腔镜袖状胃成形术(laparoscopic sleeve gastropasty, LSG)的减重效果,又具备微创的特点,则有更多的人会考虑手术。

内镜下袖状胃成形术(endoscopic sleeve gastropasty, ESG)作为一种无切口的微创减重术式,于2013年首次被描述<sup>[10]</sup>。ESG的原理是通过腔内缝合系统沿胃体进行全层缝合,形成限制性袖状胃,从而减少胃容量<sup>[11]</sup>。目前,国外很多研究都证实了ESG的安全性,在全球范围内具有重要的临床应用价值<sup>[12-15]</sup>。因此,本文将结合文献,针对这一术式进行分析,并探讨ESG的现实价值以及未来前景。

### 一、ESG的发展

ESG也被称为“阿波罗方法”,是基于Apollo Endosurgery公司研发的第2代OverStitch内镜缝合锁边系统(endoscopic suturing system),它采用全层内镜缝合装置(Apollo OverStitch, Apollo company, Austin, TX, USA)来建立胃体前壁、大弯和后壁的相对位置,从胃窦到胃食管连接处进行一系列间断的锁边缝合,从而完成袖状胃成形术,创建的胃腔结构与LSG非常相似<sup>[15]</sup>。早在10年前被提出<sup>[10]</sup>,但直到目前,这一术式的临床应用价值才逐渐得到减重领域专家的认可。Alqahtani等<sup>[16]</sup>的研究显示,ESG术后6、12、18个月多余体质量下降百分比(percentage of excess weight of loss, %EWL)分别为(13.7±6.8)%、(15.0±7.7)%、(14.8±8.5)%。Correia等<sup>[17]</sup>的研究显示,ESG术后1、3个月的%EWL、总体质量减轻百分比(percentage of total body weight loss, TBWL%)分别为(25.4±7.1)%、(36.3±11.4)%、(11.2±2.6)%、(15.8±4.2)%,但作者也指出,在术后3个月时,仅观察到体质指数(BMI)<40 kg/m<sup>2</sup>的患者体质量出现明显下降。相对于传统减重手术,ESG提供了更多的术式选择,特别适合于惧怕行腹腔镜手术和需要分期减重的超级肥胖患者。目前,该术式的有效性和安全性已在减重术式的对比,不同合并症患者的减重疗效中得到初步的验证,可以考虑作为减重方式的一种补充或选择<sup>[18-20]</sup>。

### 二、ESG手术缝合方式

目前,ESG术式缝合方式多样,包括双排、三角形、m形、z形和u形等<sup>[10,16,21-25]</sup>。但研究结果显示,它们术后疗效的差异没有统计学意义<sup>[26]</sup>。本文根据三角形缝合方式进行讲解。

使用内镜缝合设备(Apollo OverStitch, Apollo company, Austin, TX, USA)行胃壁全层缝合,缝合从胃角切迹水平开始,到胃底结束,使胃壁折叠,缩小胃容量。具体步骤:(1)标记胃的前壁、大弯和后壁,以确保锚定位置固定;(2)按胃前壁、大弯、后壁的顺序,进行全层缝合,然后反向重复(后

壁、大弯、前壁),每次缝合完成后,将缝合线收紧以关闭间隙,完成一次折叠,但当收紧缝合形成折叠时,使用维持折叠缝合所需的最小张力,可以轻微移动但不会绷紧;(3)到胃底距离食管胃交界处约3 cm处结束,完成8~10次折叠,最后留下一个小的胃底作为胃囊,可以延长饱腹感并延迟胃排空;(4)镜下观察确保袖胃结构形成,并检查是否有缝线需要缝合加固以及有无出血等<sup>[16,27-29]</sup>;(5)术后早期确保补水,尽量减少不适和恶心,其次质子泵抑制剂至少服用1个月<sup>[29]</sup>。

### 三、ESG与LSG

LSG是目前最常用的减重术式,而ESG被认为是LSG的模仿者<sup>[30]</sup>。尽管两者都是通过减少食物摄入来达到减重目的,但这两种手术的方式和解剖结构的变化存在很大差异。Lopez-Nava等<sup>[31]</sup>研究显示,相对于LSG,ESG术后胃肠道激素的变化波动很小。首先是胃饥饿素(Ghrelin激素),LSG术后其分泌减少符合手术预期<sup>[32]</sup>。但在ESG术后,尽管胃底完好,Ghrelin激素的分泌未代偿性增加,分泌水平在空腹和餐后保持稳定<sup>[33]</sup>。其次是GLP-1和PYY(肠促胰岛素效应—降低食欲,促进胰岛素释放),在LSG术后6个月时呈上升趋势<sup>[34]</sup>。同样地,McCarty等<sup>[35]</sup>报道了类似结果,但在ESG术后并未观察到这一变化。在胰岛素抵抗改善方面,在ESG和LSG术后,胰岛素敏感性都得到了显著改善<sup>[16,36-37]</sup>。

Alqahtani等<sup>[38]</sup>通过倾向性评分匹配比较ESG与LSG,结果显示,相较于ESG组,LSG组术后1、2、3年的EWL%更大[分别为:(95.1±20.5)%比(77.1±24.6)%、(93.6±31.3)%比(75.2±47.9)%、(74.3±35.2)%比(59.7±57.1)%]。Fayad等<sup>[39]</sup>的一项病例队列研究显示,相较于LSG,ESG术后30 d的TBWL%和BMI下降更具优势(分别为9.8%比6.6%, $P<0.001$ ;9.4%比6.7%, $P<0.001$ );但在术后6个月时,TBWL%和BMI出现了相反的下降结果(分别为17.1%比23.6%, $P<0.01$ ;17.2%比23.7%, $P<0.001$ )。此外,有研究指出,ESG与LSG术后并发症发生率差异没有统计学意义<sup>[38]</sup>。但ESG术后不良事件发生率低于LSG<sup>[39-41]</sup>;且ESG不会加重术后反流<sup>[39,42]</sup>。因此,对于存在胃食管反流的患者,可考虑先进行ESG。但是,由于目前多数研究为回顾性,且随访时间较短,需要多中心、长周期的研究来加以验证。

### 四、影响ESG术后减重效果的因素

ESG已经在国外得到广泛应用,国内目前并未广泛开展,南京医科大学附属第一医院消化内镜科范志宁教授团队报道了国内第1例ESG,术后1年的TWL%和EWL%分别为15%、66.5%<sup>[28]</sup>。尽管国外大量研究证实了ESG具有术后减重效果尚可,不良事件发生率低的优点,但相较于其他常用术式,ESG在减重效果相对逊色,可能受到术式及患者选择等因素的影响。Pizzicannella等<sup>[43]</sup>的研究指出,影响ESG术后体质量变化的原因包括:(1)术前BMI的范围,对于初始BMI<40 kg/m<sup>2</sup>的患者,减重效果更好,且初始BMI与12个月时EWL%呈负相关;(2)缝线的状态,缝合后线松动

甚至部分或完全打开,会显著影响患者体质量变化;(3)年龄与EWL%和TWL%呈负相关,可能原因是,与老年患者相比,年轻患者的依从性更高、更能坚持<sup>[44-45]</sup>;(4)6个月时的体质量减轻结果与12个月相关,6个月时EWL%>25%的患者在12个月时%EWL和%TWL更高( $P<0.001$ ),这与Manning等<sup>[46]</sup>对SG与RYGB的分析结果类似;(5)手术学习曲线;(6)缝合的方法,目前缝合的方法包括双排、三角形、m形、z形、u形等<sup>[10,16,21-25]</sup>,但根据目前研究结果,不同缝合方法术后疗效的差异没有统计学意义<sup>[26]</sup>。

### 五、小结

ESG作为一个可重复,具有微创、保留胃正常结构、并发症少且恢复快等优点的新术式,其潜在治疗价值,值得减重代谢外科医生关注。目前,ESG在国外已开展广泛,且大量的研究也证实其减重效果。尽管目前ESG在国内很少开展,但现有研究结果足以证明其潜在价值。而且,目前国内肥胖患者数量与减重手术的开展数严重失衡,还有大量的肥胖患者因为诸多原因限制了他们对于减重手术的认识和选择。因此,对于这一部分患者,需要一个新的、创伤小的、可接受程度高的术式来弥补这一空缺,而ESG的减重效果、可接受度以及安全性,在这一部分患者中的具有潜在应用价值。但国内对于这一术式的开展需要保持严谨的态度,建议由有足够多的减重例数以及丰富的减重手术经验的中心首先开展,以保证安全性。

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