JUNE 13, 2019
Vol. 6, No. 9

MedTech STRATEGIST

GI ENDOSCOPY

EndoGastric Solutions Ushers in a New Day for GERD Interventions

Mary Stuart

SPINE

Simplify Medical's Comeback in Cervical TDR

Wendy Diller

EXECUTIVE INTERVIEWS

The Future of Healthcare in a Robotics World: An Interview with Scott Huennekens

David Cassak

GASTROENTEROLOGY

The MI Revolution in GI Endoscopy: An Interview with Kenneth Chang

Mary Stuart

START-UPS TO WATCH

Sleep Medicine

Beddr: A Head-On Approach to Sleep Tracking

Colin Miller

Obesity

Nitinotes Surgical: A New Endoscopic Option for Patients with Obesity

Mary Stuart

NITINOTES

CAESAREA, ISRAEL

CONTACT

Raz Bar-On, CEO

razbaron@nitinotessurgical.com

YEAR FOUNDED

2014

WHO'S BEHIND IT

Irit Yaniv, MD, co-founder, is general partner at Accelmed; co-founder Tamir Wolf, MD, PhD, is the former medical director of Accelmed and a co-founder of several medical start-ups including Digma Medical and Theater; co-founder and inventor Dvir Keren has a background in both mechanical and industrial engineering and holds the patents behind several medical device start-ups

UNMET CLINICAL NEED

In obesity, a large treatment gap exists for patients with a body mass index of 30-40; the severity of their disease compels treatment, but most don't get invasive surgery

SOLUTION

EndoZip, an endoscopic suturing device for sleeve gastroplasty, which offers ease-of-use and reproducibility to both GIs and surgeons

FUNDING TO DATE

About $7 million provided by Accelmed (New York and Israel), MTIP (Switzerland), Elron (Israel), TechWald Holding (Italy and Israel) and Peregrine Ventures (Israel)

Obesity

NITINOTES SURGICAL: A NEW ENDOSCOPIC OPTION FOR PATIENTS WITH OBESITY

Nitinotes is a member of a rising class of companies operating in endoscopic gastroenterology, which aim to help underserved patients that have diseases of the GI system. With an automated endoscopic suturing device for sleeve gastroplasty, the start-up is targeting obesity.

by
MARY STUART

Disruption is brewing in the field of gastrointestinal endoscopy, which, until recently, was largely a diagnostic tool. Certainly, colon cancer has been prevented by endoscopic screening and the removal of suspicious polyps, and Barrett's esophagus has also already yielded to endoscopic ablation. But now this endoscopic platform is opening up to enable the minimally invasive treatment of some medically serious conditions that are even more prevalent, like obesity and GERD. According to **Apollo Endosurgery Inc.**, which is purely focused on the endoluminal treatment of such diseases, obesity alone represents a $4.8 billion global market.

The prospects for therapeutic endoscopy are attracting both surgeons and gastrointestinal clinicians, as evidenced by the recent formation of the American Foregut Society (*see "The Minimally-Invasive Revolution in Gastrointestinal Endoscopy: An Interview with Kenneth Chang, MD," this issue*). **Nitinotes Surgical Ltd.**, which was founded in Israel in 2014, aims to enable both groups to treat obesity with a fully automated endoscopic suturing device that will make it easier to perform restrictive surgery within the stomach for the treatment of obesity.

In the US, 140 million people are obese or overweight and more than 15 million of them are eligible for bariatric surgery because they're either morbidly obese (with a body mass index [BMI] of 40 or greater), or severely obese (BMI of at least 35) with a co-morbidity, but only 1% of patients get the surgery. Treatment is compelling for these patients because of the co-morbidities they already have or might develop—cardiovascular disease, diabetes, GERD, and cancer.

Nitinotes has set its sights on the large number of obesity patients that have a BMI in the 30-40 range. These people fall through the treatment gap either because they're not eligible for surgery, they don't have access for financial reasons, or they choose not to have invasive, irreversible surgery with known complications and side effects. This is the same patient population that companies developing intragastric balloons are targeting (*see "Will Allurion's Gastric Balloon Platform Grow the Obesity Market?"* MedTech Strategist, *February 20, 2019*). Nitinotes aims to offer them another option that is potentially more effective and durable for longer periods of time.

In targeting endoscopic sleeve gastroplasty, Nitinotes is entering a space that has been validated by two companies selling technologies that have been used to treat thousands of patients—Apollo Endosurgery, which coined the phrase "endoscopic sleeve gastroplasty" and **USGI Medical Inc.**, which calls its incisionless procedure *POSE*. Nitinotes plans to introduce a product with competitive advantages to a procedure with known safety and efficacy.

According to CEO Raz Bar-On, Nitinotes' *EndoZip* will make it easier for GIs, who largely don't have suturing skills, to suture and achieve consistent results, and for surgeons, who have less experience with endoscopy, to suture in the context of an endoluminal procedure.

© 2019 Innovation In Medtech, LLC. All rights reserved.

Sleeve gastroplasty and its surgical predicate sleeve gastrectomy both work by restricting the stomach. The surgical sleeve gastrectomy involves cutting and removing about half of the stomach tissue then suturing the stomach. The endoscopic sleeve gastroplasty restricts the stomach size by plicating and suturing the tissue. It thus preserves native tissue and is theoretically reversible and revisable years later if it becomes necessary, which is not the case for surgical procedure. The surgical procedure generally results in more weight loss, but it comes with more complications such as new onset GERD, post procedure.

And there are some other fundamental differences. The surgical procedure results in fast gastric emptying, while sleeve gastroplasty causes slow gastric emptying. According to various hypotheses, the different outcomes have to do with the fact that in the case of surgery, a section of the stomach containing influential hormones is removed, or portions of stomach muscle become paralyzed. There is some evidence that the gastroplasty patients experience greater satiety with a decreased caloric intake. (The influence of satiety on both procedures remains controversial, however.)

Nitinotes set out to create procedure that would level the playing field by making endoscopic suturing easier and making it possible for clinicians with a variety of skill levels to achieve consistent results. The company's *EndoZip* device is advanced into the stomach, and positioned at the stomach body section. The operator deploys a vacuum function on the device, which causes the stomach to collapse and its wall to protrude into windows all along the length of the chamber of *EndoZip*, creating a series of bulges or nipples. The operator pushes a button, and a helical needle is activated, suturing the nipples to connect anterior and posterior walls. Bar-On notes that the suturing needle moves proximally by a special gear that the company developed. At the end of the procedure, the device creates tension over the suture, then closes it with a plastic clip and cuts it. "The end result is a suturing line with the number of bites the chamber allows—currently it is about 5 cm long—and it is consistent along its length, with the same pitch and distance between bites," according to Bar-On.

Nitinotes aims to level the playing field by making endoscopic suturing easier so clinicians with a variety of skill levels can achieve consistent results.

At Digestive Disease Week in May 2019 (the annual meeting of the gastroenterology and hepatology specialties), the company presented six month results of its first-in-human study of 13 patients who underwent sleeve gastrectomy with *EndoZip*. The prospective, open label, single-center study (led by Gontrand Lopez-Nava, MD, PhD, at the Bariatric Endoscopy Unit at HM Sanchinarro Hospital, Madrid, Spain), did not result in any intraprocedural or early serious adverse events. Mean total body weight loss, percentage of body weight loss, and percent of excess body weight loss at six months were 16.7 kg, 15.4%, and 53.7%, respectively. The procedure time dropped from two hours for the first procedure, to 25 minutes after some operator experience.

Bar-On notes that the first device isn't a commercial version of *EndoZip*, and that a second prototype that's more flexible, easier to use, and more automated is already in development. Future iterations might also incorporate the company's own visualization system as well, although for now *EndoZip* is designed to work with endoscopes on the market. Finally, while Nitinotes is currently developing a single-use device, in the future it plans to offer a multi-use console that is connected to replaceable suturing heads.

Nitinotes has chosen to seek an obesity label. Bar-On notes that forerunners in the field have had difficulty gaining reimbursement with products with general clearances for suturing or approximation of soft tissue. Still ahead lies the challenge of getting the therapy to pass the stringent requirements of the FDA for an obesity therapy with this degree of risk, which, says Bar-On, means delivering 8% more weight loss than is achieved in the sham control arm, or "differentiating the procedure from the weight loss program."

However, market risk appears to be low. Bar-On says, "I think there is no question about the size of the market and the margins you could have with a good product. The questions are safety, efficacy, and coverage. If you can effectively show low risk promising weight loss results for at least one year and gain coverage from the insurers, then you are there."

Nitinotes is on track to deliver what Bar-On describes as the ideal bariatric endoscopy. "At the end of the day you need to find a solution that is safe, easy to use, and takes no longer than 30-45 minutes. And of course it should be durable and effective, by which I mean 15% of total body weight loss after a year."

Online print subscriptions, reprints, and web posting and distribution licenses are available.
Contact Bridget Kelly-Stoll | 888-202-5939 | b.stoll@medtechstrategist.com