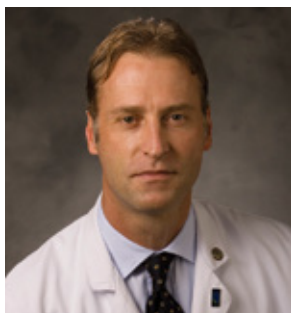


# 'REAL-WORLD' EXPERIENCES OF SURGEONS USING THE V-LOC™ 180 DEVICE

## RESULTS OF AN INTERNATIONAL SURVEY

V-Loc™ 180 Absorbable Wound Closure Device



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### **DISCLOSURES:**

Medtronic, North Haven, Connecticut (USA), initiated and provided funding for this project. The author serves as an advisor and was involved in reviewing and interpreting the results as well as writing of the manuscript and received compensation from Medtronic.

### **PRODUCT DISCUSSED:**

V-Loc™ 180 absorbable wound closure device

## **ABSTRACT**

### **Introduction**

Various suture materials are available today, including absorbable and non-absorbable, braided and monofilament types that are commonly utilized for different surgical procedures. However, despite possible differences in quality and ease of usage, their utilization likely depends on surgeons' preference and accessibility of a certain suture type. The V-Loc™ 180 device has been introduced into clinical practice as a knotless, self-anchoring surgical suture with the goal of facilitating wound closure and providing superior outcomes.

### **Methods**

To gain insight into the experiences of surgeons using the V-Loc™ 180 device, an international survey of 79 surgeons in 13 countries was conducted during 2009. Surgeons were identified by local representatives and were asked to try samples of V-Loc™ 180 device for incision closure during commonly performed surgical procedures of their choice. Surgeons subsequently completed a questionnaire (8 closed and 2 open-ended questions) to ascertain their experiences.

### **Results**

99% of surgeons reported that the V-Loc™ 180 device was easy to use, passed through tissue easily, and was clinically acceptable. The V-Loc™ 180 device replaced an average of 4 conventional suture strands, reducing the overall closure time by 29 minutes (among the 5 surgeons providing a time estimate). Most responding surgeons (95%) thought that the V-Loc™ 180 device could serve as a replacement for their current dermal closure method and anticipated using the V-Loc™ 180 device for an average of nearly three quarters of future surgical procedures.

### **Conclusion**

This international survey of surgeons' experiences using the V-Loc™ 180 device revealed a high, consistent level of positive feedback with respect to ease of use, number of conventional suture strands replaced, and reduction in overall incision closure time. Greater familiarity with the surgical applications and attributes of the V-Loc™ 180 device will likely escalate in the future as 95% all of the surveyed surgeons thought that the V-Loc™ 180 device could serve as a replacement for their current dermal closure method and anticipated using the V-Loc™ 180 device for an average of nearly three quarters of future cases.

## **INTRODUCTION**

A variety of methods are available for the apposition of wound edges, such as non-suture materials as well as a variety of degradable and non-degradable sutures. Standard wound closure with sutures commonly involves tying knots within or outside the repair and may be more time consuming than alternative wound closing methods.<sup>1</sup> The introduction of knotless, self-anchoring surgical sutures (barbed sutures) such as the V-Loc™ 180 device ([www.medtronic.com](http://www.medtronic.com)) may provide surgeons with a more efficient means to close soft tissue wounds without the need to tie knots.<sup>2,3,4</sup> Barbed sutures, which are now being utilized in a variety of surgical settings, have been used to close multiple dermal layers simultaneously, according to the surgeon's preference, and offer potential savings in closure time compared with conventional suture methods (Fig. 1). To gain further insight into the application, attributes, and key benefits of the V-Loc™ 180 device in clinical practice, an international questionnaire was fielded among surgeons in various surgical settings, including plastic, general, cardio-thoracic, orthopedic, urologic, and obstetric/gynecologic (OB/GYN) surgery.

## METHODS

The survey involved 79 surgeons in 13 countries including the United States, Austria, Belgium, France, Germany, Italy, Netherlands, Sweden, South Africa, Switzerland, Spain, UK, and New Zealand, and was conducted between June and September 2009. Surgeons, identified by regional representatives, were asked to try samples of V-Loc™ 180 device for incision closure during common surgical procedures of their choice. Surgeons subsequently completed a questionnaire (8 closed and 2 open-ended questions) to ascertain their experiences of using the V-Loc™ 180 device, focusing on the number of conventional sutures replaced, savings in overall wound closure time, ease of use and clinical acceptability, the potential to supersede surgeons' existing dermal closure methods, and possible concerns or limitations.

### Profile of Surgeons Surveyed

Overall, the 79 participating surgeons performed a total of 151 procedures using the V-Loc™ 180 device, the most common of which were abdominoplasty (18%), breast reductions (17%), breast reconstructions (11%), coronary artery bypass grafting (11%), and hernia procedures (10%). Most of the procedures were performed by plastic surgeons (71%) followed by general surgeons (13%) and cardiovascular surgeons (11%) and were conducted primarily in European countries (70%) and the US (29%).

TABLE 1. Average number of conventional sutures replaced by 1 V-Loc™ 180 device according to surgical specialty.

SPECIALTY	AVERAGE NUMBER OF SUTURES REPLACED <sup>1</sup>	NUMBER OF PROCEDURES	NUMBER OF SUTURES REPLACED (WEIGHTED AVERAGE)
Plastic Surgery	4	107	2.83
General	2	16	0.21
CV Procedures	2	20	0.26
OB/GYN	5	4	0.13
Urologic	1	1	0.01
Orthopedic	1	1	0.01
Neurologic	4	1	0.03
Other	4	1	0.03
Overall Average	3	151	4 <sup>1</sup>

1. Rounded to reflect entire suture strand replacement.

### Number of Conventional Sutures Replaced

Considering all of the surgical procedures together, one V-Loc™ 180 device, on the average, replaced four conventional suture strands (Table 1). The highest average number of sutures replaced was six strands during breast reduction surgery. In one instance, four V-Loc™ 180 devices replaced 50 interrupted Polysorb™ sutures during incision closure after a bilateral breast reconstruction with a Latissimus dorsi muscle flap.

### Savings in Wound Closure Time

A majority of surgeons (80%) stated that the V-Loc™ 180 device reduced the overall time to close an incision (Fig. 1), with an average savings of 29 minutes (among the 5 surgeons providing a time estimate). These findings are consistent with the results of recent studies showing that the V-Loc™ 180 device closes wounds up to 50% faster compared with standard suture methods.<sup>5</sup> Faster closure time using the V-Loc™ 180 device may potentially arise as a result of circumventing the need for knot tying, closing multiple dermal layers simultaneously, and avoiding the necessity to tighten up the closure after individual bites using a conventional suture.

### Ease of Use

99% of surgeons surveyed reported that the V-Loc™ 180 device was easy to use, passed through tissue easily, and was clinically acceptable (Fig. 2). Individual surgeons commented that the V-Loc™ 180 device was intuitive to use, allowed good tissue approximation, and was especially convenient with long wounds or incisions. Most surgeons (99%) said that they would recommend the V-Loc™ 180 device to a colleague.

### Future Use

A majority of surgeons (95%) noted that the V-Loc™ 180 device could serve as a replacement for their current dermal closure method (Fig. 3). Indeed, surgeons noted that they anticipated using the V-Loc™ 180 device for an average of 73% of cases in the future. In the US, utilization of the V-Loc™ 180 device is gaining momentum, as evidenced in this survey by 60% of US surgeons choosing to use V-Loc™ 180 device in more than one procedure.

### Concerns and Problems

While the survey captured predominately positive experiences with the V-Loc™ 180 device, individual surgeons expressed several concerns and problems, most of which were related to specific surgical procedures (Table 2).

TABLE 2. Concerns and Problems Raised by Surgeons.

CONCERNS AND PROBLEMS	PROCEDURE
Needle was dull, bent, or broken by the end of surgery	TRAM flap procedure (patient had past mastectomy and radiation that resulted in tough tissue)  Long incision procedures
A running stitch could be problematic if the suture broke	Cleft palate repair
Loop was too small and suture length too long for laparoscopic purposes. Needle shaft prevents light flash back, so needle position is difficult to judge. Round-bodied needle with either a cutting edge or taper point would be preferable.	Laparoscopic procedures
One week post-surgery, incision looked pink. The color faded after 3 weeks.	Cranial vault remodeling (one case)

TRAM = Transverse Rectus Abdominis Myocutaneous

## DISCUSSION

Many methods are available today for wound closure of different complexity. The results of commonly applied conventional suture techniques depend on the technical expertise of the operator, and training requirements needed to obtain optimal results.<sup>6</sup> Standard wound closure with sutures routinely involves tying knots within or outside the repaired site, and may be more time consuming than alternative wound closing methods.<sup>1</sup> It has been acknowledged decades ago that if interrupted sutures are placed along the length of an incision, the tension is concentrated at the individual suture loops, rather than divided equally along the entire wound length.<sup>7</sup> In addition, pressure induced ischemia and necrosis have been identified as the principal factors leading to wound dehiscence, which may be caused by conventional suture techniques.

Barbed sutures have been developed as a self-anchoring suture device, requiring no knots or slack management<sup>2,3,4</sup> potentially facilitating wound closure and providing improved outcomes. These characteristics may particularly be applicable in plastic surgical wound closures, such as 'body contouring' procedures and many others (Figs. 4A-E). This industry sponsored study was designed to gain insight into the early experiences of surgeons using the newly introduced V-Loc™ 180 device with respect to ease of use, number of conventional suture strands replaced, and reduction in overall incision closure time.

In the author's opinion, the wound edge approximation is comparable to other wound closure techniques with excellent scarring. The time savings can be significant. The V-Loc™ 180 device however, in his opinion, should not be applied in wounds with excessive tension. In this scenario interrupted mattress type sutures remain the author's preferred technique.

## CONCLUSION

The V-Loc™ 180 device has been introduced into clinical practice as a knotless, self-anchoring surgical suture with the goal of facilitating wound closure and providing superior outcomes.

This international survey of surgeons' experiences using the V-Loc™ 180 device revealed a high, consistent level of positive feedback with respect to ease of use, number of conventional suture strands replaced, and reduction in overall incision closure time. Greater familiarity with the surgical applications and attributes of the V-Loc™ 180 device will likely escalate in the future as the majority of the surveyed surgeons thought that the V-Loc™ 180 device could serve as a replacement for their current dermal closure method and anticipated using the V-Loc™ 180 device for an average of nearly three quarters of future cases.

## FIGURES

FIGURE 1. V-Loc™ 180 device strand



FIGURE 2. Time savings associated with wound closure using the V-Loc™ 180 device and surgeons' perceptions of ease of use.

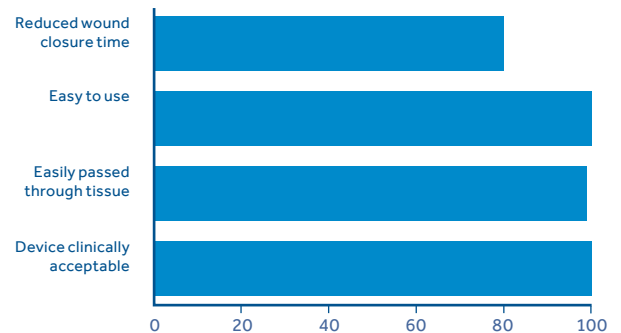


FIGURE 3. V-Loc™ 180 device as a potential replacement for existing dermal closure methods and anticipated use in future surgical procedures.

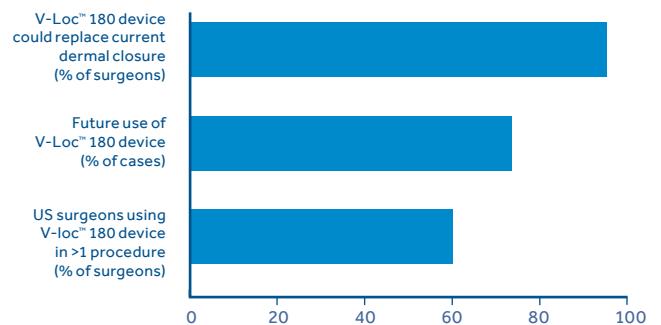


FIGURE 4A-E. 45 year old female with symptomatic pannus formation after massive weight loss; before (A, B) and after (C, D and E-close-up) panniculectomy/abdominoplasty. Ideal application for the Medtronic V-Loc™ 180 device absorbable wound closure.

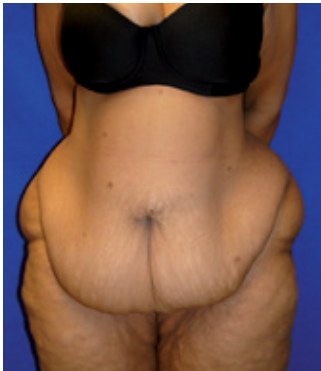


Figure 4A



Figure 4B



Figure 4C



Figure 4D



Figure 4E

## REFERENCES

1. Singer, A. J., Quinn, J. V., Clark, R. E., et al. Closure of lacerations and incisions with octylcyanoacrylate: A multicenter randomized controlled trial. *Surgery* 131: 270, 2002.
2. Leung JC, Ruff GL. Barbed, bi-directional surgical sutures. International Conference and Exhibition on Healthcare and Medical Textiles, conference proceedings July 8-9, 2003, Bolton, UK. Available at [www.angioedupro.com/Quill/index.php?seek=278](http://www.angioedupro.com/Quill/index.php?seek=278).
3. Ruff G. Technique and uses for absorbable barbed sutures. *Aesthet Surg J* 2006; 26:620-8.
4. Murtha AP, Kaplan AL, Paglia MJ, Mills BB, Feldstein ML, Ruff GL. Evaluation of a novel technique for wound closure using a barbed suture. *Plast Reconstr Surg* 2006; 117:1769-80.
5. <http://www.medtronic.com/covidien/products/wound-closure/barbed-sutures>
6. Singer, A. J., Hollander, J. E., Valentine, S. M., et al. Association of training level and short-term cosmetic appearance of repaired lacerations. *Acad. Emerg. Med.* 3:378, 1996.
7. Price, P. B. Stress, strain and sutures. *Ann. Surg.* 128: 408, 1948.

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