

Evaluation of a Novel Absorbable Subcuticular Skin Stapler In Plastic Surgery

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Summary

We have evaluated a novel absorbable subcuticular skin stapler to determine its clinical performance in terms of safety, efficacy and cosmesis in select plastic surgery procedures, including abdominoplasties, breast reductions, mastopexies and body contouring procedures. Our experience included over 30 surgical patients. The incisional closures were observed immediately post-surgery and generally at one week and three week follow-up visits. We have also followed several patients up to six months to determine if any noticeable changes have occurred. The absorbable staples demonstrated equivalent efficacy compared to our standard closure methods. Typical closures were closely approximated with good eversion and no apparent inflammatory reaction. We found the use of the device to be simple and comfortable, with a substantial reduction in hand fatigue. The use of the absorbable stapler significantly reduced operative and anesthesia time, and significantly reduced the number of sutures utilized. Overall, our patients expressed a high degree of satisfaction with the absorbable staple closure.

Introduction

The objectives of surgical wound closure are safe, effective healing with good cosmetic results. Effective time utilization of health care professionals in the surgical suite and post-operatively can be a determining factor in the selection of a closure modality. A number of incisional closure techniques are available, including a variety of suture materials, metal skin staplers, tissue glues and adhesive dressings. We evaluated this new mechanical skin closure modality to determine its effectiveness in our surgical practice.

Materials and Methods

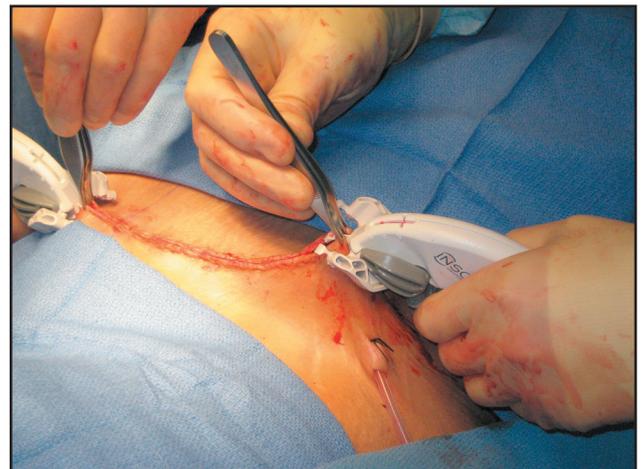
We utilized a new absorbable subcuticular skin stapler (INSORB®|20 Subcuticular Skin Stapler, Incisive Surgical, Inc., Plymouth, MN) to close abdominoplasties, breast reductions, mastopexies, panniculectomies, and a few other plastic surgical procedures such as medial thighlifts and lower leg excisions.

The stapler is a sterile, single patient use device that contains 20 absorbable staples. The device utilizes a novel closure method which precisely presents the dermis and then places an absorbable staple in a horizontal, subcuticular, and interrupted fashion to provide a secure well-approximated, everted closure. The absorbable staples are made of a polylactide-polyglycolide co-polymer with an established history in wound closure. The staple design features a U-shaped curvature with cleats at the two distal ends to secure the subcuticular tissue. In these excisional surgical procedures, we utilized the absorbable staples with the same intention as deep dermal sutures, followed by a running subcuticular suture.



INSORB®|20 Subcuticular Skin Stapler
INSORB Absorbable Staple
INSORB|1 Forceps

We utilized a proprietary double Adson forceps (INSORB|1 Forceps) which allows a single clinician to pick up and approximate both tissue edges. The technique involves placing the forceps onto the shelves of the nose of the stapler over a designated tissue capture zone over the needle path. The heel of the stapler has to be below the dermis and the stapler has to be level. As the stapler lever is advanced, the tissue is compressed into a 'capture' zone. Two surgical needles are then advanced into the capture zone to create a precise 'bite' of dermis on both sides of the incision simultaneously deploying a staple horizontally into the subcuticular tissue. The cleats of the staple secure the tissue. The absorbable staples were placed at approximately 6- to 10-mm intervals, followed by a running subcuticular suture over the absorbable staples. Standard adhesive strips or transparent adhesive dressings were used on the closure for wound protection.

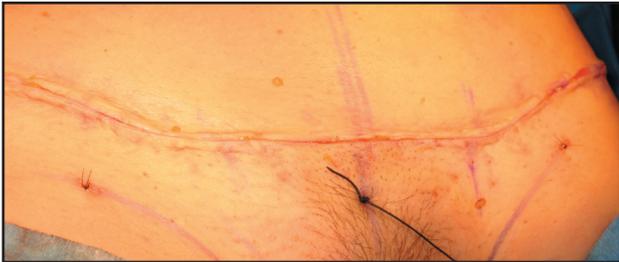


Abdominoplasty

For our abdominoplasty procedures, a three-layer closure technique was utilized, as follows:



1. Relieve tension in Scarpa's fascia with interrupted sutures



2. Use absorbable staples as deep dermal sutures



3. Place a running subcuticular suture to complete closure

Results

We utilized this new absorbable stapler and forceps for select plastic surgery procedures. Although the technique was different from the placement of metal skin staples, it was easily adopted by the surgical team. The use of the double Adson forceps (INSORB|1 Forceps) makes it much easier for a single operator to use the absorbable stapling device. The device is ergonomically designed and simple to use. We found that, with experience, closure times with the subcuticular skin stapler significantly reduced operative times by an average of 20-30 minutes for abdominoplasties and 15-20 minutes for breast reductions and mastopexies. In addition, we typically reduced the number of suture packs by approximately 30-50%. We found the reduced suture cost savings alone justified the costs of the absorbable stapler. The use of the absorbable subcuticular skin staples resulted in a pre-approximated, pre-everted closure which allowed for simple and fast final closure with a running subcuticular suture.

We have had experience with over 30 patients with the absorbable subcuticular stapler and have observed no infections, hematomas or seromas to date. Further clinical experience is necessary to determine if this experience continues.

We have been pleased to date with the resulting cosmesis associated with the absorbable subcuticular skin stapler. All of our incisions appeared to be equivalent to our prior closure technique with respect to cosmesis, with a number of incisions that appeared to be superior. Patients have remarked of their satisfaction with regard to comfort and cosmesis of their wounds.



Conclusions

It is understood in the medical community that an optimal incisional closure technique results in minimal tension on the wound edges with good eversion and approximation. In addition, productivity in the surgical suite, as well as on the hospital floor and clinic, is a subject of increasing interest. Lastly, we have experienced an increased sophistication in our patients as they become better informed of surgical options, including skin closure modalities.

Use of the absorbable subcuticular skin stapler resulted in a uniform, symmetric, everted skin closure. Our clinical results indicate that the incisional closure is equivalent to subcuticular suturing with respect to efficacy. We found that the speed of the subcuticular stapler is significantly faster than subcuticular suturing, reducing operative and anesthesia times. Use of the absorbable staples resulted in low maintenance wounds. Our patients expressed a high degree of satisfaction with the wounds closed by the absorbable staples.

This initial experience suggests that the use of the absorbable subcuticular skin stapler provides a significant time savings, is cost-effective and results in a high degree of patient satisfaction for many plastic surgery procedures.

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