

# Experience with a New Absorbable Subcuticular Skin Stapler Designed For Short Incisions in Anterior Lumbar Interbody Fusion Surgery

Jonathan E. Schoeff, M.D., F.A.C.S.

In this day and age, healthcare is increasingly patient-centric and driven by their options and choices. Our goal is to educate our patients and empower them to participate in decisions about their care. Every aspect of our practice is focused on optimizing clinical outcomes & managing economic challenges associated with an ever-evolving healthcare system. Patient satisfaction remains central to this effort.

To ensure that we are successful in achieving these objectives, we have placed substantial emphasis in our surgical practice on utilizing the latest techniques and technology to perform the majority of procedures through smaller incisions, using special instrumentation. This less-invasive or minimally invasive approach has been proven to dramatically decrease recovery time after surgery and overall need for narcotic pain medication, and to reduce the time to return to full activity and work with an overall improvement in quality of life.

We understand that, while the choice of skin closure modality is typically surgeon driven, patient's still view incisional closure as a reflection of procedural quality and attention to detail. Surgeon's choice of modality has an important effect on the clinical and economic outcome of a surgical procedure. In this regard, we evaluated a new version of an absorbable subcuticular stapler to determine its clinical performance in terms of safety, efficacy, outcomes, cosmesis and patient-satisfaction in skin closure of anterior lumbar interbody fusion surgical incisions. In our clinical experience of over 250 patients, the absorbable subcuticular staples demonstrated equivalent efficacy compared to percutaneous metal staples and subcuticular suturing. Typical closures were closely approximated with good eversion and no apparent inflammatory or erythemic reaction. We found the use of the device to be simple and time-effective, and a truly single-operator closure technique. In addition, absorbable subcuticular skin staples were more comfortable and acceptable in appearance to the patients than percutaneous metal staples, while also eliminating the inconvenience, cost, anxiety and discomfort of staple removal. We have been especially pleased with the speed, cosmetic outcome and reduced complications of these closures, and our patients have expressed a high degree of satisfaction with the absorbable staple closures.



INSORB  
Absorbable Staple



INSORB|Shorty  
Subcuticular Stapler

## Introduction

The objectives of surgical wound closure are safe, effective healing with good cosmesis. 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. Prior to the absorbable subcuticular staple, our only choices for dermal closure were either subcuticular suturing or percutaneous metal skin staples. Initially, our goal was to reduce operative time and eliminate sharps injuries with a rapid closure modality that would not create additional, unnecessary trauma and pain for our patients.

## Materials and Methods

We utilized a new version of the INSORB Subcuticular Skin Stapler designed for closure of shorter incisions (INSORB®|Shorty Absorbable Subcuticular Skin Stapler, Incisive Surgical, Inc., Plymouth, MN) to close anterior interbody fusion incisions at Sky Ridge Medical (Lone Tree, CO). The novel INSORB Subcuticular Skin Closure Modality has been commercially available for over 10 years in a version with 30 Absorbable Staples. The INSORB|30 Absorbable Subcuticular Skin Stapler is a sterile, single patient use device designed to close incisions up to 21-cm in length. The INSORB|Shorty Subcuticular Stapler is a sterile, single patient use device that contains 8 absorbable staples, sufficient to close up to an 8-cm incision. The device utilizes a novel method which precisely presents the dermis to surgically-sharpened needles, and then places an absorbable staple in a horizontal, subcuticular fashion to provide a secure, well-approximated, interrupted and everted closure. The absorbable staples are made of a benign polylactide-polyglycolide co-polymer with an established history in wound closure. The staple design features a U-shaped curvature with hooks at the two distal ends to secure the dermis.

## Results

The device is ergonomically-designed and simple to use. We found that, with experience, closure times with the subcuticular skin stapler closely approximated closure times with a metal skin stapler, and was significantly faster than subcuticular suture closures. The use of the absorbable subcuticular skin staples resulted in a uniform, symmetric, everted interrupted skin closure without percutaneous tissue insult.



At Surgery

Note: Wound Approximation and Eversion

Natural physiologic drainage is permitted with the absorbable staple closure, which may be seen as slightly wetter dressings at the first dressing change which may be responsible for reduced seromas, hematomas and SSIs. There appears to be no apparent inflammatory response which may be due to the interrupted nature of the closure, the benign polymer and the absence of compression/trauma created by percutaneous metal staples. Studies have found that INSORB Absorbable Staples “had a significantly lower incidence of wound infection and inflammation [in contaminated wounds] when compared to continuous intradermal suture closure with Monocryl™ monofilament suture or Vicryl™ braided suture.” [The Influence of Skin Closure Modalities on Infection: A Comparison of Absorbable Subcuticular Staples, Continuous Subcuticular Absorbable Suture, and Percutaneous Metal Skin Staples in the Closure of Contaminated Wounds. Journal of Long-Term Effects of Medical Implants, 2012.]



At 8 Weeks

Anterior Spine Approach



At 6 Weeks

OLIF51 Spine Procedure

The absorbable subcuticular skin staples demonstrated equivalent efficacy compared with metal skin staples and subcuticular suturing. We experienced a reduced incidence of wound complications with significantly improved cosmesis and patient satisfaction. The use of the absorbable subcuticular skin stapler eliminated the cost, inconvenience, and patient discomfort associated with post-operative removal of metal staples.

## Conclusions

It is well understood that an optimal skin closure results in a secure, uniformly-approximated wound with eversion and minimal tension on the superficial skin edges. The INSORB Skin Closure Modality achieves these objectives with a rapid, easy, single-practitioner method. Furthermore, this modality provides advantages of minimal wound care and improved clinician safety.

Use of the absorbable subcuticular skin stapler resulted in a uniform, everted skin closure with interrupted subcuticular staples without the percutaneous tissue insult associated with metal skin staples. Our clinical results indicate that the incision closures are equivalent to metal skin staples and subcuticular suturing with respect to efficacy. We found that the speed of the subcuticular stapler is similar to that of metal skin staples, and faster than subcuticular suturing, reducing operating room times. The use of the ergonomically-designed stapler is comfortable and resulted in reduced postoperative complications, low maintenance wounds and the elimination of staple removal. Our patients expressed a high degree of satisfaction with the wounds closed by absorbable staples.

Based on our experience with the subcuticular stapler designed for shorter incision and absorbable staples, I believe there is no other closure device commercially-available that creates absorbable tensionless everted dermal closure with excellent approximation – which is the key to uncomplicated, beautiful cosmetic results – with excellent patient satisfaction.



Jonathan E. Schoeff, MD  
Sky Ridge Medical Center

*Dr. Schoeff is a board certified general surgeon, specializing in less invasive anterior (LISS) and minimally invasive anterolateral (MIS) spinal access surgery. In founding Rocky Mountain Advanced Spine Access, he seeks to combine expertise from extensive training in advanced spine exposure techniques with experience acquired through a case volume exceeding 2000 spinal exposure procedures, to optimize care of patients undergoing anterior spine surgery. He serves as an educator and innovator in the field of spinal access surgery and actively participates in surgical education, training more than 100 surgeons from the United States and abroad in these advanced techniques. Dr. Schoeff does not have any financial interest in or financial relationship with Incisive Surgical.*