

# A Revolutionary Advance in Skin Closure Compared to Current Methods

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**ABSTRACT:** Six pigs were used to evaluate the influence of three separate modalities on contaminated wounds. Full-thickness skin wounds on the abdomen were contaminated with  $10^4$  or  $10^5$  *Staphylococcus aureus* and then closed with one of three methods. The three closure modalities included (1) a new absorbable staple (Insorb™) placed in the subcuticular tissue, (2) braided Vicryl™ suture, and (3) percutaneous metal staples. Any foreign body material implanted in tissue increases the risk of infection at that site. Wound closure always involves the use of a foreign body. Historically, sutures have been the primary material used to close tissue. The newer synthetic sutures are significantly more biodegradable and cause less infection than sutures composed of protein, such as silk and catgut. Metal staples are also associated with a low risk of infection. Recently, Incisive Surgical, Inc. (Plymouth, Minnesota) developed an absorbable polymer staple specifically for subcuticular skin closure. The purpose of this study was to compare the new Insorb™ staple to an absorbable polymer suture and to a metal staple.

Wound infection was assessed 7 days after closure by clinical signs and quantitative bacterial swabs. The results demonstrated that wounds closed with Insorb™ staples had the lowest incidence (33%) of infection, followed by percutaneous metal staples (44%). All wounds (100%) closed with Vicryl™ sutures became infected. The incidence of wound infection directly correlated with the level of quantitative bacterial count at analysis. The Insorb™ staple was associated with significantly reduced closure time, less inflammation and infection, and better aesthetic result compared to Vicryl™. Compared to metal staples, the Insorb™ subcuticular staplers demonstrated comparable closure time without the need for later staple removal.

In conclusion, the Insorb™ staple is a superior choice for the closure of contaminated wounds compared to the Vicryl™ suture, because the Insorb™ staples produce a significantly ( $p = 0.009$ ) lower incidence of infection. The Insorb™ staple is a revolutionary advance in subcuticular skin stapling.