A New Bioabsorbable Stapler for Closing Trocar Incisions

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Objective:

Design a bioabsorbable skin stapler to efficiently close short and minimally invasive incisions beneath the skin surface that can be operated by a single user.

Description:

Skin staplers that apply metal staples:

+ Save time
+ Are strong
- Have higher risk of infection as compared to subcuticular closure [1]
- Cosmetically unacceptable for MIS

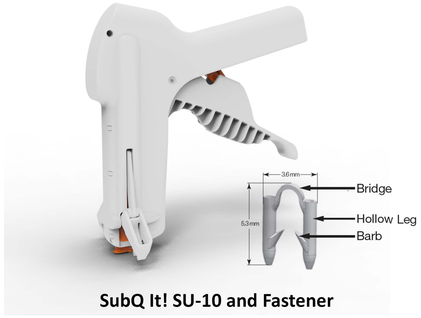
Manual bioabsorbable sutures are recommended but are challenging



- Access to inner surfaces in such small space
- High skill level required
- Adds time to procedure
- Risk of needle stick

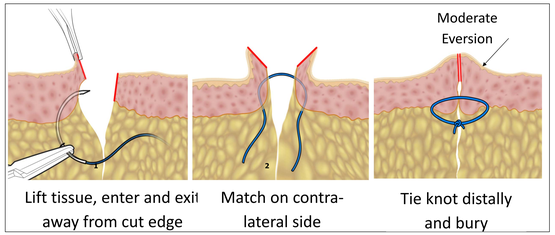
Challenges in developing bioabsorbable stapler for short / trocar incisions

- Simultaneous access to underside of both edges
- Holding tissue securely to resist insertion forces
- Single user operation - positioning tissue and operating device

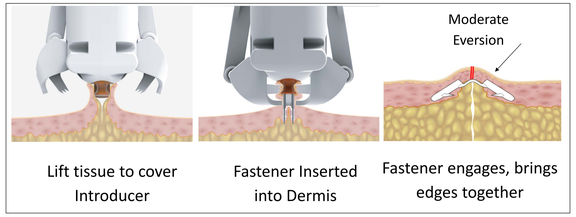


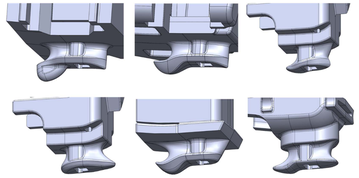
SubQ It! SU-10 and Fastener

Manual Set-back Buried Dermal Technique [2]



SubQ It! Stapler [3]



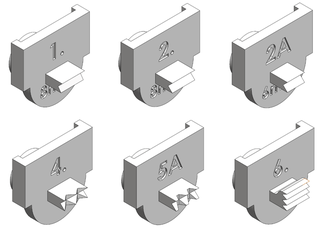


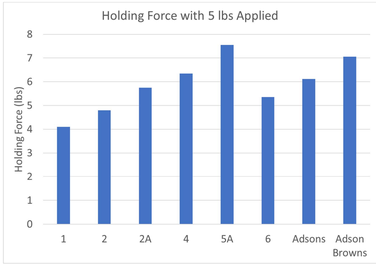
Many shapes evaluated

Atraumatic holding of tissue during insertion

- Experimentally determined best characteristics of pincers:

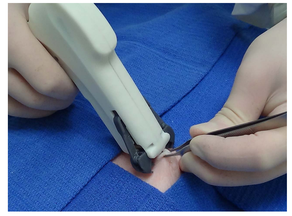




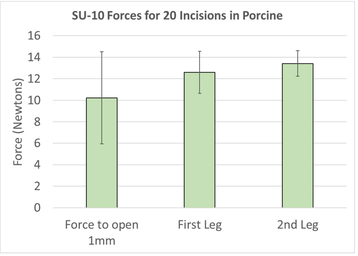


Introducer provides that "extra hand"

- Placed at one apex
- Forceps at other apex
- Traction aligns, thins tissue
- Allows tissue to be lifted



Preliminary Results



Conclusions / Future Direction

- Potential improvement over metal staplers and manual subcutaneous stitches
- Next Steps:
  - Complete Development
  - Conduct Clinical Evaluations

References

1. Kobayashi S, Ito M, Sugito M, Kobayashi A, Nishizawa Y, Saito N. "Association between incisional surgical site infection and the type of skin closure after stoma closure", Surg Today. Jul 2011; 41(7):941-5.

2. J. American Academy Dermatology, 2010 Feb, pg 352-353, "Letters to the Editor", Kantor, Jonathan

3. SubQ It! SU-10 Stapler, Opus KSD, Inc. 50 Corporate Park Dr. Ste 710, Pembroke, MA 02359, Tel: 339 933 8811