Dermatology Review:

Surgical Techniques for Optimal Wound Closure

American Academy of Dermatology
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I do not have any relevant relationships with industry.
Surgical Instruments

They make a difference
WEBSTER NEEDLE HOLDER
(A. Diamond jaws, B. Smooth jaws)
**Do I Use A Serrated or Smooth Jaw Needle Holder?**

Serrated jaws: Holds suture needle more secure going through tissue

Smooth jaws: Good for 6/0 and won’t tear suture
Adson Forceps Tips

Shown here are the tips sizes of forceps with teeth.

- **Smallest** = 0.6mm
- **Standard** = 1.0mm
- **Heavy** = 1.5mm

The most popular Tip size is the 1mm.
Gradle Scissors

• The delicate curved tips allow for quick and total removal of tags
• Very useful for thin skin such as eyelids
Undermining / Dissecting Scissors

Similar as the tissue scissor when selecting, however also look at tip to see if you want the thinned down tip that facilitates the early stage of undermining.
CUTTING SUTURE WITH SCISSORS
What you really need to know about... **Instruments**

- There are many instrument choices when you are ready to purchase.
- The size of your hand and personal preference are key factors.
- Quality does matter, cheap instruments end up being a bigger cost to you.
- The cost of the instrument upkeep and sharpening should be considered at time of purchase.
- Instrument cleaning and sterilizing procedures are very important to be performed properly.
Sutures & Needles for Every Procedure

- Physical properties
- Configuration
- Coating
- Capillarity
- Tensile strength
- Size
## Absorbable Sutures

<table>
<thead>
<tr>
<th>Suture (Brand Name)</th>
<th>Configuration</th>
<th>Handling</th>
<th>Knot Strength</th>
<th>Tissue Reactivity</th>
<th>Initial Tensile Strength</th>
<th>Longevity of Tensile Strength</th>
<th>Time to Complete Absorption</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical gut, plain</td>
<td>Multifilament</td>
<td>Intern</td>
<td>Poor</td>
<td>High</td>
<td>Low</td>
<td>Lost in 7–10 days</td>
<td>70 days</td>
<td>Unpredictable absorption rates</td>
</tr>
<tr>
<td>Fast-absorbing gut</td>
<td>Multifilament</td>
<td>Intern</td>
<td>Poor</td>
<td>High</td>
<td>Low</td>
<td>Lost in 3–7 days</td>
<td>21–42 days</td>
<td>High reactivity, True allergy possible</td>
</tr>
<tr>
<td>Chronic surgical gut</td>
<td>Multifilament</td>
<td>Intern</td>
<td>Fair</td>
<td>Moderate to High</td>
<td>Low</td>
<td>Lost in 10–21 days</td>
<td>90 days</td>
<td>Unpredictable absorption rates, High reactivity, True allergy possible to collagen or chromate</td>
</tr>
<tr>
<td>Polyglycolic acid (Dexon S)</td>
<td>Multifilament</td>
<td>Braided</td>
<td>Good</td>
<td>Good</td>
<td>Low to intern</td>
<td>Intermediate</td>
<td>60–90 days</td>
<td>Uncocated</td>
</tr>
<tr>
<td>Polyglycolic acid (Dexon II)</td>
<td></td>
<td>Braided</td>
<td>Good</td>
<td>Good</td>
<td>Low to intern</td>
<td>Quite high</td>
<td>50% strength at 3 weeks</td>
<td>Coated</td>
</tr>
<tr>
<td>Polyglactin 910 (Vicryl)</td>
<td>Multifilament</td>
<td>Braided</td>
<td>Good</td>
<td>Good</td>
<td>Low to intern</td>
<td>Quite high</td>
<td>50% strength at 3 weeks</td>
<td>Coated</td>
</tr>
<tr>
<td>Polyglactin 910 (Vicryl Rapid)</td>
<td>Multifilament</td>
<td>Braided</td>
<td>Good</td>
<td>Good</td>
<td>Low to intern</td>
<td>Quite high</td>
<td>&gt;30% strength at 3 weeks</td>
<td>Coated</td>
</tr>
<tr>
<td>Lactomer (Polyorb)</td>
<td>Multifilament</td>
<td>Braided</td>
<td>Good</td>
<td>Good</td>
<td>Low to intern</td>
<td>Quite high</td>
<td>50% strength at 3 weeks</td>
<td>Coated</td>
</tr>
<tr>
<td>Polydioxonane (PDS II)</td>
<td>Monofilament</td>
<td>Poor</td>
<td>Poor</td>
<td>High</td>
<td>Low</td>
<td>50% at 4 weeks, 25% at 6 weeks</td>
<td>90–180 days</td>
<td>High memory, Very slow absorption</td>
</tr>
<tr>
<td>Polytrimethylene carbonate (Maxon)</td>
<td>Monofilament</td>
<td>Very good</td>
<td>Very good</td>
<td>Very low</td>
<td>Very high</td>
<td>50% at 4 weeks, 30% at 6 weeks</td>
<td>60–180 days</td>
<td>Higher initial tensile strength than PDS but absorbs more quickly</td>
</tr>
<tr>
<td>Poliglecaprone 25 (Monocryl)</td>
<td>Monofilament</td>
<td>Very good</td>
<td>Very good</td>
<td>Very low</td>
<td>Highest</td>
<td>30% at 2 weeks, All lost at 3–4 weeks</td>
<td>90–120 days</td>
<td>Highest initial tensile strength, Highest knot security of synthetic absorbable sutures</td>
</tr>
<tr>
<td>Glycomer 631 (Biosyn)</td>
<td>Monofilament</td>
<td>N/D</td>
<td>N/D</td>
<td>N/D</td>
<td>49% retained at 3 weeks</td>
<td>90–110 days</td>
<td>Decreased coefficient of friction than Monocryl, Swell less used in dermatologic surgery</td>
<td></td>
</tr>
</tbody>
</table>

1 Trademark of Ethicon
2 Trademark of US Surgical, Inc.

N/D, not data available.

Very low—low—poor—fair—good—moderate—intermediate—relatively high—very high—very good—highest
Equal Cosmetic Outcomes with 5-0 Poliglecaprone-25 Versus 6-0 Polypropylene for Superficial Closures

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| Silk (SofSilk) 
(Perma-Hand) | Multifilament Braided | Excellent | Low | Excellent | Low | High | Use limited by high incidence of tissue reaction Very slowly absorbed in tissue Monofilament nylon may tear through delicate tissue Very slowly absorbed in tissue |
| Nylon (Monosof) 
(Dermalon) | Monofilament | Poor | High | Poor | High | Low | |
| Nylon (Nurulon) 
(Surgilron) | Multifilament | Good | High | Fair | Moderate | Moderate | |
| Polypropylene (Prolene) | Monofilament | Poor | Moderate | Poor | High | Low | Does not degrade in tissue |
| Polypropylene-uncoated 
(Dacron) | Multifilament Braided | Very good | Very high | Very good | Moderate | Moderate | Expensive and rarely used in dermatologic surgery Very high tensile strength If silicone dislodges from suture, significant tissue reaction can occur Polybutylate coating very adherent to suture and very seldom breaks off into tissue Exhibits elasticity Low friction coefficient Very seldom used |
| Polyester, coated 
(Ticron) | Multifilament Braided | Silicone-coated | Multifilament | Polybutylate-coated | Very good | Very high | Good | Moderate | Moderate |
| Polyester, coated 
(Ethibond Excel) | Multifilament Braided | Silicone-coated | Polybutylate-coated | | | | | | |
| Polybutester (Novafil) | Monofilament | Good | High | Good | Low | Low | |
| Polytetrafluoroethylene-VDF (Pronova) | Monofilament | N/D | N/D | N/D | N/D | N/D | |

† Trademark of Ethicon Inc, Johnson & Johnson (Somerville, NJ) 
‡ Trademark of USSDG Sutures, US Surgical Corporation (Norwalk, CT) 
N/D, no data available.
My Favorites

- Closure on Face
  - Deep
    - 5.0 Vicryl or equivalent
    - 5.0 Monocryl or equivalent
      - P or PC needle
  - Surface
    - 5.0 or 6.0
      - Nylon
      - Prolene or equivalent
      - Monocryl or fast absorbing gut surface
      - P or PC needle
My Favorites

• **Eyelids**
  – 5.0 or 6.0 Vicryl, or equivalent, *buried*
  – 6.0 Chromic, Fast absorbing gut or Vicryl *surface*
    – PC Needle

• **Scalp**
  – 3.0 or 4.0 Vicryl, Monocryl or PDS *deep*
    – FS or PS Needle (reverse cutting)
  – 3.0 or 4.0 Nylon or Prolene *surface*
    – P or PS Needle
  – *If no tension, gut or Vicryl on surface*
My Favorites

• **Trunk or Extremities**
  – 3.0 or 4.0 Vicryl, Monocryl or PDS *deep*
    – FS or PS Needle on the back
  – 4.0 or 5.0 Nylon, Prolene or Monocryl *surface*
    – P or PS Needle

• **Subcuticular Closure**
  – 4.0 or 5.0 Prolene or Monocryl
    – P or PC Needle
Tips for Optimal Wound Closure

Do the “BEST” closure for All Wounds
Preferred lines of closure
Relax Skin Tension Lines (Preferred Lines of Closure)
Make every closure a cosmetic closure
Figure 7. To camouflage an excision within smoothly curving skin tension lines, the tangent-to-circle method can be modified so that a straight line is cut along one side of the defect (A). A clinical example would be an off-center defect on the dorsal surface of the lower nose area (B), where a straight line along one side of the ellipse would appropriately orient the lower dog-ear in the midline of the columella, while creating an overall curvature of the final closure (C).
Suture Techniques Cannot Overcome Poor Excisional Designs
Minimize Tension
Undermine Widely In The Same Plane
Equal Deep Bites  
Evert The Closure

- Shallow bites invert the closure
Regardless Of The Suturing Technique
Wound Eversion Is The Goal
Bury Subcutaneous Knots
Repair Dog Ears
Keep It Simple

• In most cases a simple interrupted will do
Where there Is Tension Use a Buried Suture

• Often a single Vicryl or Monocryl suture will do
Left Over Absorbable Sutures?

- No problem using 4-0 or smaller on the skin
- Suture degradation rate is not an issue
- Still need to remove; except gut sutures
Tips on Wound Closure
Tips for Closing Tight Wound Defects
Anti-tension Clamps
Pulley Stitch
Horizontal Mattress
Surgical Wound Dressing

• Do them with pride

• Functional

• Provide supplies or sources
3M micropore paper tape
Postoperative Care

• Instructions
• Handouts
• Activity Advice
• Warnings about swelling, hematoma, drainage and infection