Job Readiness Workshop for 6th Year Medical Students

Repair of Episiotomy & lacerations: Hands on practice on models

Objectives

- **To develop hands-on skills for suturing.**
- The learner will understand the basic principles of universal precautions, sterile technique, gentle tissue handling with forceps, and knot tying.

Objectives

❖**Upon completion of this skills training module, the learner will be able to:**

- Describe the differences between suture materials.
- Describe the procedural aspects of the following suturing techniques:

  Simple interrupted, Continuous (Running) & Subcuticular running.
- Demonstrate the appropriate use of suture instruments (needle holder, scissors and forceps).
- Demonstrate proficiency of the following suturing technique on inanimate model:

✓Technique for Simple Interrupted Suturing

✓Technique for Continuous (Running) Sutures

✓Technique for Subcuticular (Running) Suturing

Surgical sutures

- **Surgical sutures are classified based on various factors including:**

➢ Absorbability (Absorbable vs Non-absorbable)

➢ Their material (Natural vs Synthetic)

➢ Structure (Monofilament vs Multifilament)

Absorbable Sutures

- **These are naturally broken down by the body over time.**

- **<u>Examples:</u>**

➢ Polyglycolic Acid (PGA)

➢ Polyglactin 910 (Vicryl)

➢ Poliglecaprone 25 (Monocryl)

➢ Polydioxanone (PDS)

➢ Catgut (chromic and plain)

Non-Absorbable Sutures

- **These need to be removed manually or are left in the body, where they are not absorbed.**

- **<u>Examples</u>**

➢Silk

➢Nylon (Ethilon, Dermlon),

➢Polypropylene (Prolene, Surgipro)

➢ Polyester (Ethibond)

Natural Sutures

- **Made from organic sources, like animal intestines or silk.**

- **<u>Examples:</u>**

➢ Silk

➢ Catgut (Plain, Chromic)

Synthetic Sutures

- **Man-made materials that often have more predictable absorption rates and fewer immune responses.**

- **<u>Examples:</u>**

➢ Nylon (Ethilon, Dermlon)
➢ Polypropylene (Prolene, Surgipro)
➢ Polyglycolic Acid (PGA)
➢ Polyglactin 910 (Vicryl)
➢ Poliglecaprone 25 (Monocryl)
➢ Polydioxanone (PDS)

Monofilament Sutures

- **Made of a single strand, which reduces tissue drag and infection risk but can be harder to handle.**

- **<u>Examples:</u>**

➢ Nylon (Ethilon, Dermlon)

➢ Polypropylene (Prolene, Surgipro)

➢ Polyglycolic Acid (PGA)

➢ Polydioxanone (PDS)

➢ Poliglecaprone 25 (Monocryl)

Multifilament (Braided) Sutures

- **Composed of multiple strands, they provide better knot security but have higher tissue drag and a higher chance of harboring bacteria.**

- **<u>Examples:</u>**

➢ Polyglactin 910 (Vicryl)

➢ Silk

➢ Nylon (Nuralon)

➢ Polyester (Tricon)

Coated Sutures

- **Coated with substances like antimicrobial agents or silicone to reduce friction and improve handling.**

- **<u>Examples:</u>**

➢ Coated Vicryl

➢ Coated Polyester

Barbed Sutures

- **Have barbs that eliminate the need for knots, often used in cosmetic surgery and laparoscopic procedures.**

- **<u>Examples:</u>**

➢ V-Loc

➢ Stratafix

➢ Quill

➢ Durabar

Sutures & Needles

- Sutures are numbered by their size relative to their diameter.
- Thick suture numbering is from 0-10, with #10 being the largest diameter.
- Thin sutures are those that have the greatest number of zeroes after them and range from 1-0 to 12-0 (12-0 having the least breaking strength).
- The needle can be straight or curved, which is more common.
- Amongst needles, there are different types based on the needle tip, mainly cutting or taper needles (Round: sharp or blunt).

Table 1: Classification of sutures Table 2: Important definitions when describing sutures Figure 1: Needle Anatomy Figure 2: Common Types of Needles Contributed by Jessica Rose, DO

Figure 1. Needle Anatomy

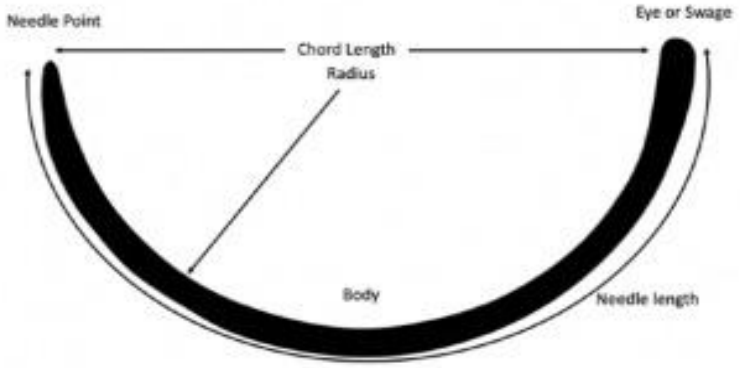


Figure 2. Common Types of Needles

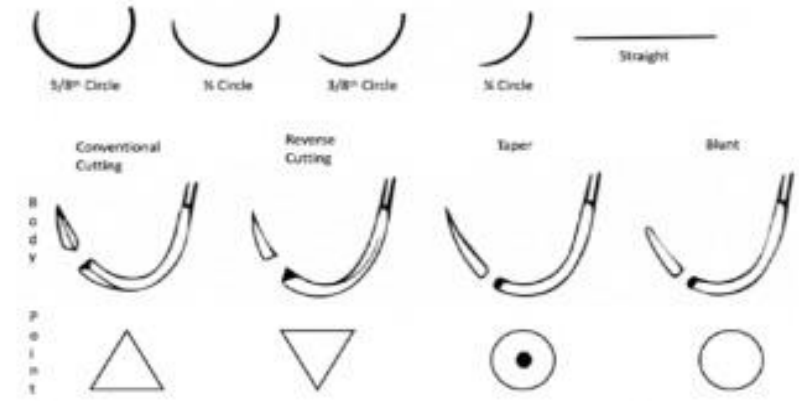


Table 1. Classification of sutures

	Suture Material	Other
Absorbable	**Monofilament** Polyglyconate (Maxon) Polyglytone 6211 (Caprosyn) Polydioxanone (PDS, PDO) Poliglecaprone (Monocryl) Polyglactone 72 (Monoderm) Glycolide/lactide (Polysorb) Glycomer 631 (Biosyn) **Multifilament** Polyglactin 910 (Vicryl)	**Natural fiber**: catgut, silk, surgical gut, chromic gut
Non-absorbable	**Monofilament** Nylon (Ethilon) Polypropylene (Prolene) Polybutester (Novafil) Polyester (Merselene, Ethibond) **Multifilament** Silk Polyester (Velosorb)	**Metallic**: stainless steal

Table 2. Important definitions when describing sutures:

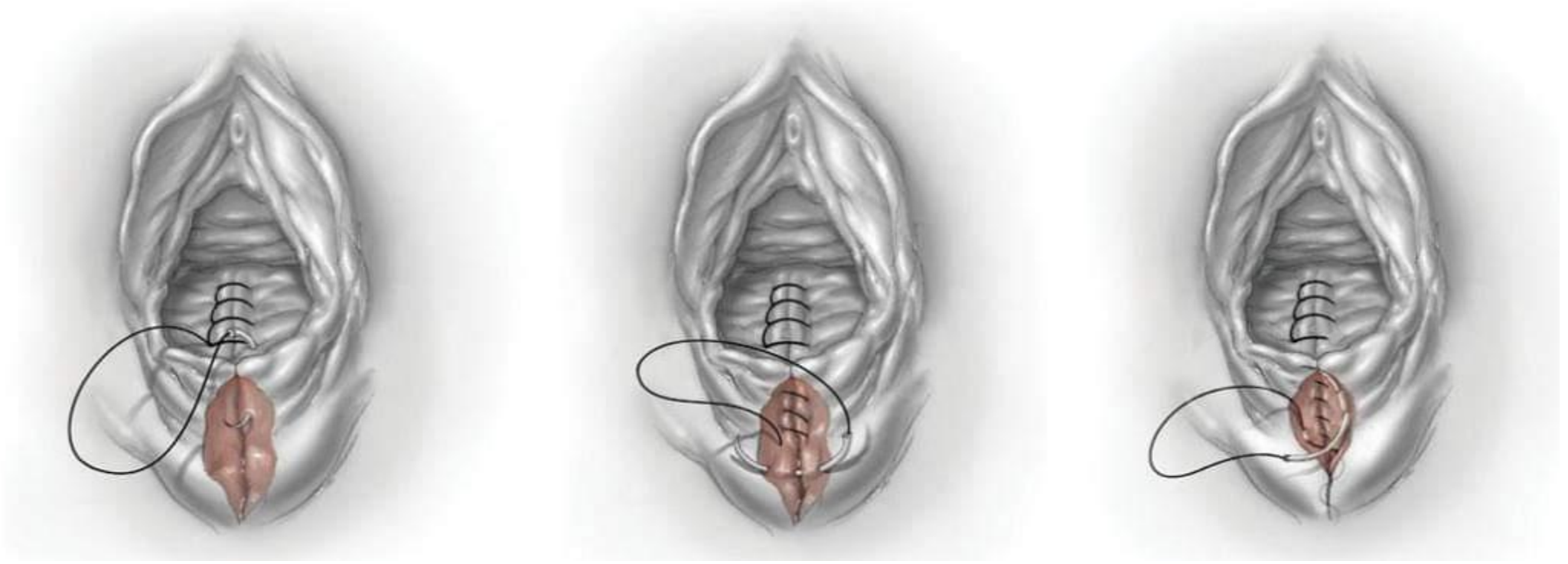
Knot strength	**amount of force needed for knot to slip, related to the friction and ability to stretch**
Elasticity	the ability of the suture to stretch and recoil
Plasticity	when the suture stretches but does not recoil
Memory	ability to return to its shape after it is manipulated, less pliable
Coefficient of friction	suture's relative resistance to being passed through a tissue, higher means more local tissue damage
Tensile strength	suture's ability to resist breakage

Suturing techniques

- **Each suturing technique is chosen based on factors like wound type, tissue tension, healing time, and cosmetic considerations:**

- Interrupted Sutures
- Continuous (Running) Sutures
- Subcuticular (Intradermal) Sutures
- Mattress Sutures (horizontal, vertical)
- Purse-String Sutures
- Buried Sutures
- Figure-of-Eight Sutures
- Retention (Tension) Sutures
- Deep Sutures

Surgical Repair



- **Reference:**
- **Sutures And Needles**
- Jessica Rose; Faiz Tuma.
- Author Information and Affiliations
- Last Update: August 28, 2023
- From National Library of Medicine