Surgical suture

- Craniosynostosis in Saudi Arabia: A Retrospective Analysis of Subtype Patterns, Syndromic Risk, and Postoperative Outcomes
- Automated Sella-Turcica Annotation and Mesh Alignment of 3D Stereophotographs for Craniosynostosis Patients Using a PCA-FFNN Based Approach
- Extended Phenotype of Bilateral Coronal Craniosynostosis Due to Novel TCF12 Mutation
- Novel Device for Intraoperative Quantitative Measurements of Extraocular Muscle Tensile Strength
- Simulation and comparison of objectively graded microsurgery steps by using a microscope and Symani robotic system by young professionals
- Cranial Bone Changes Associated With Intracranial Hypertension in Apert Syndrome: Insights for Early Surgical Intervention
- Three-Dimensional-Printed Skull Models Improve Caregiver Understanding of Craniosynostosis: A Randomized Controlled Trial
- Case report and literature review: endoscopic extended endonasal resection of two cases of giant chondroma

Surgical suture is a medical device used to hold body tissues together after an injury or surgery. Application generally involves using a needle with an attached length of thread. Several different shapes, sizes, and thread materials have been developed over its millennia of history. Surgeons, physicians, dentists, podiatrists, eye doctors, registered nurses and other trained nursing personnel, medics, and clinical pharmacists typically engage in suturing. Surgical knots are used to secure the sutures.

Techniques

Interrupted Suture

Far-Near-Near-Far Suture

Intracutaneous suture

Wound dehiscence was more common in the intracutaneous suture group than in the far-near-near-far suture group. Delayed wound healing occurred more in the far-near near-far suture group than in the intracutaneous suture group. Also, the far-near near-far interrupted point suture group showed a higher delayed wound healing ratio than the crossover suture.

Sealing incisions with sutures and staples is the gold-standard of wound closure; however, biological glues have challenged this technique. While neurosurgical wounds, particularly those made in the dura, are less dynamic and under less fluid pressure than those of the pulmonary and cardiovascular system, biological glues that increase the reliability and resilience of these closures would significantly reduce morbidity from postoperative cerebrospinal fluid leak. Currently, the only Food and Drug Administration (FDA) approved dural sealant is DuraSeal (Integra, Waltham, Massachusetts), a polyethylene glycol hydrogel, which has both cranial and spinal formulations, and has been demonstrated to be safe and effective [1)].

Classification

Surgical sutures are classified based on various factors, including their material, structure, absorption properties, and usage.

Here is a detailed classification:

1. Based on Absorption

1. **Absorbable Sutures**: Degrade and lose tensile strength over time due to enzymatic or hydrolytic processes.
    1. **Examples**:
        1. Natural: **Catgut (Plain, Chromic)**
        2. Synthetic: **Polyglycolic Acid (Dexon), Polyglactin 910 (Vicryl), Poliglecaprone (Monocryl), Polydioxanone (PDS)**

1. **Non-Absorbable Sutures**: Retain tensile strength for a long time; used for long-term support.
    1. **Examples**:
        1. Natural: **Silk, Cotton**
        2. Synthetic: **Nylon suture (Ethilon), Polypropylene (Prolene), Polyester (Mersilene), PTFE (Gore-Tex), Stainless Steel**

2. Based on Material Composition

1. **Natural Sutures**: Made from organic materials; more prone to tissue reaction.
    1. **Examples**: Catgut, Silk suture
2. **Synthetic Sutures**: Manufactured polymers; induce less inflammation.
    1. **Examples**: Vicryl, PDS, Monocryl, Prolene

3. Based on Structure

1. **Monofilament Sutures**: Single-stranded, smooth, and less prone to infection but harder to handle.
    1. **Examples**: Nylon, Prolene, PDS, Monocryl
2. **Multifilament (Braided) Sutures**: Multiple fibers twisted or braided; offer better knot security but higher infection risk.
    1. **Examples**: Silk, Vicryl, Dexon, Mersilene

4. Based on Coating

1. **Coated Sutures**: Have a coating (e.g., antimicrobial, wax) to reduce friction or infection risk.
    1. **Examples**: Coated Vicryl (Polyglactin 910), Coated Polyester (Ethibond)
2. **Non-Coated Sutures**: Lack a protective coating.
    1. **Examples**: Plain Catgut, Silk

5. Based on Tensile Strength Duration

1. **Short-Term Absorbable** (7-14 days): Plain Catgut, Fast-Absorbing Gut
2. **Medium-Term Absorbable** (3-4 weeks): Vicryl, Monocryl
3. **Long-Term Absorbable** (Up to 6 months): PDS, Maxon

6. Based on Usage

1. **General Closure**: Vicryl, PDS, Prolene
2. **Skin Closure**: Nylon, Polypropylene (Prolene), Staples
3. **Cardiovascular Surgery**: Polypropylene (Prolene), PTFE
4. **Ophthalmic Surgery**: Nylon, Silk
5. **Orthopedic Surgery**: Stainless Steel, PDS
6. **Gastrointestinal Surgery**: Vicryl, PDS

Triclosan-containing sutures

Triclosan-containing sutures

Intradermal suture

Intradermal suture

Barbed suture technology

Barbed suture technology

Dural suture

Dural suture.

1)
Cosgrove GR, Delashaw JB, Grotenhuis JA, Tew JM, Van Loveren H, Spetzler RF, Payner T, Rosseau G, Shaffrey ME, Hopkins LN, Byrne R, Norbash A. Safety and efficacy of a novel polyethylene glycol hydrogel sealant for Water-tight dural repair. J Neurosurg. 2007 Jan;106(1):52-8. PubMed PMID: 17236487.