

## **SUTURE MATERIALS. REQUIREMENTS FOR MATERIALS. THE SPECIFICS OF THE APPLICATION**

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Suture material - a material for surgical sutures and dressings of blood vessels. Suture materials can be broadly classified as naturally occurring and synthetic. They can be further classified as monofilament or multifilament (braided), dyed or undyed, coated or uncoated. Several parameters, such as tensile strength, breaking strength, elasticity, capillarity and memory are used to describe physical characteristic of sutures.

In general, braided sutures are more prone to infection and induce greater degree of tissue reaction. Advantages of braided sutures include ease of handling, low memory and increased knot security. A monofilament suture is a single material. These sutures have decreased tendency of infection, ease of passage through tissue and ease of removal. They possess poor handling characteristics and decreased knot security.

The search for new and improved suture materials started with the Egyptians, who as early as 2000 B.C. used linen to close wounds. [1] Around A.D. 75, Galen experimented with catgut and, in 1869, Lister introduced the practices of impregnating catgut with chromic acid and sterilizing suture material. [1] In the early part of this century, Halsted promulgated the advantages of silk over catgut, and silk soon became the most common suture material in surgical practice. [2]

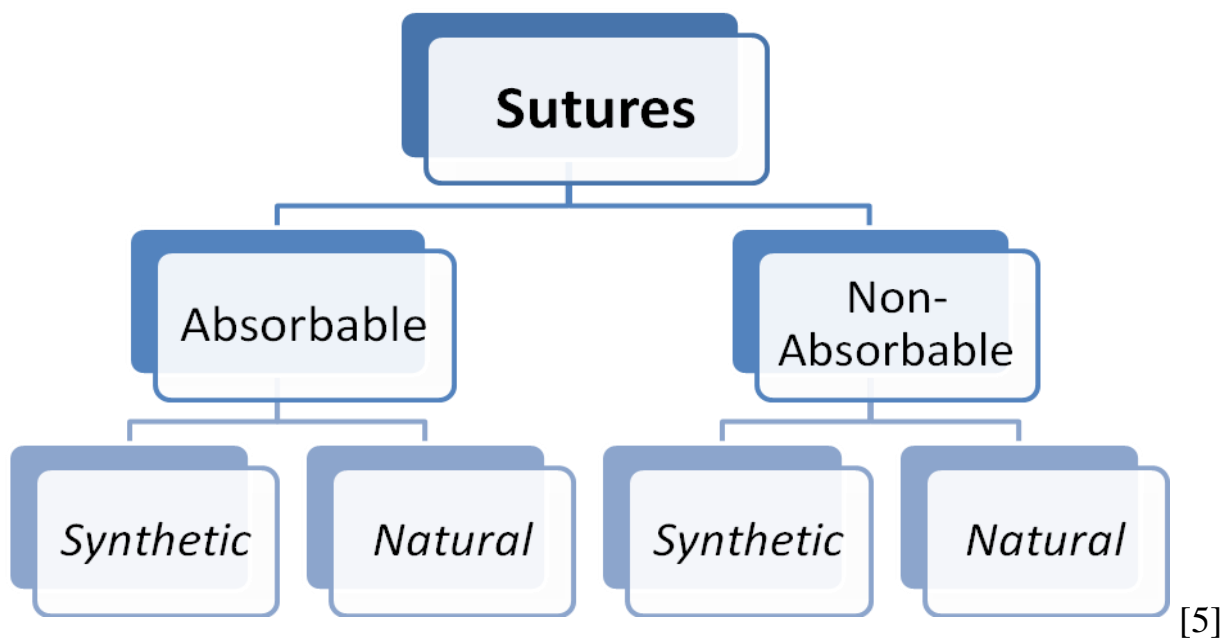
Ideal suture material should: have good handling characteristics; not induce significant tissue reaction; allow secure knots; have adequate tensile strength; not cut through tissue; be sterile; be non-electrolytic; be non-allergenic; cheap.

A number of standardized terms describe the properties of suture materials. [2] Tensile strength is defined as the amount of weight required to break a suture, divided by its cross-sectional area. The U.S. Pharmacopeia provides a standard for identifying tensile strength in a digit-hyphen-zero form, where increasing digits correspond to

decreasing suture diameter. Thus, 3-0 nylon suture has a greater diameter than 5-0 nylon and possesses greater tensile strength.

Knot strength is a measure of the amount of force necessary to cause a knot to slip and is directly related to the coefficient of friction of a given materials. [3]

There are many kinds of sutures, with different properties suitable for various uses. Sutures can be classified into two groups: absorbable sutures and non-absorbable sutures. An absorbable suture breaks down in tissue after a given period of time. It degrades as a wound or incision heals. A non-absorbable suture resists the body's attempt to dissolve it. Non-absorbable sutures may be removed by a surgeon after a surface incision has healed. [4]



There are some suture materials: Catgut simple; Chrome catgut; Vikryl; Monokryl; Silk; Kapron; Mylar; Polypropylene.

A systematic comparison has been made of six suture materials used as subcuticular closure of abdominal incisions in dogs. The effect on wound healing was measured by mechanical, biochemical, and histologic methods. No difference was demonstrated in wound breading strength among wounds closed with different suture materials up to 28 days postoperatively. At 70 days, wounds sutured with nonabsorbable sutures were weaker than those closed with absorbable sutures, but this difference probably was due to a much higher incidence of infection in wounds closed with nonabsorbable sutures. It was our observation that monofilament sutures

were superior to multifilament sutures with regard to the incidence of wound infection.

Conclusions. «Wounds can heal by second intention, or they can be closed by a variety of methods. Although the skill and technique of the surgeon are important, so is the choice of wound closure materials. The purpose of these materials is to maintain wound closure until a wound is strong enough to withstand daily tensile forces and to enhance wound healing when the wound is most vulnerable.» [6] So, all suture materials should have good handling characteristics; not induce significant tissue reaction; allow secure knots; have adequate tensile strength; not cut through tissue; be sterile; be non-electrolytic; be non-allergenic. These characteristics are important, because the patient's life depends on them.

#### REFERENCES

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