Introduction

Dermatologic wounds can heal by second intention, or they can be closed by a variety of methods. 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 ***(Falanga et al., 1988).***

In order to fully appreciate the essentials of a wound closure, it is first important to understand the process of wound healing. Healing occurs in 3 stages: inflammation, tissue formation, and matrix formation and remodeling. The inflammation stage begins within minutes after an injury. This stage is necessary to establish hemostasis and to begin mobilization of the immune system. The second stage is the tissue formation stage in which reepithelialization, angiogenesis, and fibroblast proliferation and migration predominate. During the final stage, the extracellular matrix, which is composed of fibronectin, hyaluronic acid, proteoglycans, and type III collagen, is deposited and constantly altered with the final accumulation of mature type I collagen. This stage may occur for as long as 6-12 months after wounding ***(Clark, 1985)***.

Wound strength gradually increases during the healing process. After 2 weeks, a wound has less than 10% of its final healed strength. By this time, most superficial or percutaneous closure materials are removed, and the resulting wound has little to rely on for strength unless additional support is available. Wound strength increases to 20% by 3 weeks and to 50% by 4 weeks. At 3-6 months, a wound achieves its maximum strength, which is 70-80% of its original strength ***(Elliot & Mahaffey, 1989).***

The physical characteristics of a suture material determine its utility; these characteristics include configuration, diameter, capillarity and fluid absorption, tensile strength, knot strength, elasticity, plasticity, and memory**.**Understanding the various characteristics of available suture materials is important to make an educated selection. No one suture possesses all desirable characteristics. The optimal suture should be easy to handle and have high tensile strength and knot security. Any tissue reaction should be minimal, and the material should resist infection and have good elasticity and plasticity to accommodate wound swelling. A low cost is preferred. Although some of the newer materials available have many of these properties, no one material is ideal and compromises must be made ***(Bennett, 1988).***

A wide range of metals and their alloys, polymers, ceramics and composites are used in surgically implanted medical devices and prostheses constructed of more than one kind of material (implants of complex composition). Since the early 1900s, metal alloys have been developed for these applications to provide improved physical and chemical properties, such as strength, durability and corrosion resistance. Major classes of metals used in medical devices and dental materials include stainless steels, cobalt–chromium alloys and titanium (as alloys and unalloyed). In addition, precious metals (gold, platinum, palladium or silver), nickel and copper that may in some cases contain smaller amounts of many other elements, added to improve the alloys' properties ***(Homsey, 1983).***