Arthroscopic Ho: YAG laser Meniscectomy

The menisci are important structural and functional components of the knee joint. The torn meniscus is the most common cause of mechanical knee symptoms, and over the years meniscectomy has been one of the most frequently performed elective orthopaedic surgical procedures. Arthroscopic meniscal surgery was introduced in Japan in the 1960s and primarily, through the work of O'Connor in the 1970s, it became a reliable and effective method for dealing with meniscal lesion.

Arthroscopic meniscectomy continues to be the most commonly performed arthroscopic procedure and among the most successful and rewarding. As the applications of arthroscopy expands arthroscopic surgery has become a routine procedure due to the availability of excellent video systems and the development of new and efficient instruments, so does the need to adapt existing cutting and dissecting tools for effective use. The shortcoming and limitations of conventional arthroscopy are frequently encountered with the opening and closing of surgical instruments in tight compartmental spaces, and in developing effective tools that can cut and coagulate tissue without causing damage to the adjacent tissues.

Several groups of surgeons have undertaken arthroscopic laser surgery because of the advantages of laser instruments for arthroscopic techniques. Extremely small but powerful tools with exciting new possibilities inspired the creativity of engineers and surgeons alike.

As single instrument, lasers can cut, coagulate, and ablate depending on the method by which the laser energy is applied.

Lasers have been used in some medical disciplines (e.g., ophthalmology, gynecology, dermatology, E.N.T., general surgery, etc...) for several years, but they have only recently been implanted as an arthroscopic tool. The primary obstacle had been the inability to develop laser systems that work effectively in saline medium. Recently, a number of laser systems have been developed that can be used in saline medium to transmit laser energy fiberoptically.

Clinically, the **Holmium: Yttrium Aluminum Garnet (HO: YAG) laser** has been used most frequently in the knee and shoulder joints. In the knee, the laser is currently being used for meniscal resection, soft tissue release (lateral release, plica resection), resection of scar tissue (e.g., arthrofibrosis), and chondroplasty. The most promising clinical use for **HO: YAG laser** has been for partial meniscectomy.

A laser system employed for this purpose must quickly and precisely ablate meniscal tissue, produce a small thermal damage zone, have fiberoptic capability, and be able to irradiate tissue in a saline medium. Because of its strong absorption of water, the **HO: YAG laser** effectively and precisely ablates meniscal tissue with only moderate necrosis at the ablation site, its energy can be transmitted by fibers and used in saline medium.