

THERMAL CAPSULORRHAPHY – FACT AND FALLACY

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The use of thermal energy is no novelty. In the old Hypocrates writing, there was record of the use of red-hot iron to create scar tissue to stabilize the shoulder. The main attraction of the modern thermal capsulorrhaphy probably stems from the fact that it offers direct visual of the procedure, easily applicable with the currently available equipment and apparently gives both the patients and the surgeons an immediate “feeling” of stabilization. However, we must revisit the issue with a critical review on the basic sciences of the procedure. The joint capsular tissue is shortened or tightened by the thermal energy at temperature range from 72 - 80 °C. There is immediate deleterious effect such as the loss of mechanical property as a result of collagen denaturation and cell necrosis. Soon after this period, the treated tissue is repaired actively by the residual population of fibroblast and visual cell with improvement of the mechanical property. The tissue in between the treated region is a very important part of the entire reparative process as it significantly improves the healing process. With the passage of time, the shrinkage tissue will stretch out as it is subjected to the physiological loading after the surgery. It is therefore postulated that the improvement in the stability is due to the maintenance of the initial capsular shrinkage with secondary fibrosis and resultant thickening of the capsule. But there is at the same time, loss of the sensuous stimulation due to the destruction of the sensory receptors, thereby creating a possible scenario with the reduction of proprioception, which may have a significant bearing of the function of the joint. The clinical outcome from various studies has been conflicting. Advocates of the procedure claimed success rate between 65% - 75% with a follow up of around 2 years. However, a recent report on thermal capsulorrhaphy for multi-directional instability cited a significant failure rate in the region of 47% with 4 patients having axillary nerve dysfunction out of a series of 19 patients and this is an alarming complication. It is therefore generally accepted that the maximal allowed shrinkage is within 15-20%. Any over treatment will lead to severe immediate and permanent tissue damage. The difficult area is that it is not possible to quantify the extent of energy applied to the tissue.

At present, there still exist enormous controversies as to the proper place of thermal capsulorrhaphy in the clinical syndrome of multi-directional instability. The use of thermal capsulorrhaphy as an adjunct to arthroscopic stabilization for uni-directional anterior instability has not been well accepted. Despite the massive marketing in the

industry in the early phase of the introduction of this technique, the recent clinical outcome studies have certainly sounded a strong note of caution.