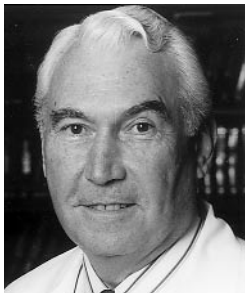
Editorial



Arthroscopic Synovectomy

In the not too distant past, synovectomy of the knee was a major orthopedic procedure. It was generally performed as a last stage effort to minimize the destructive effects of an exuberant synovium such as that seen with pigmented villonodular synovitis, aggressive rheumatoid arthritis, hemophilia, or chronic post-traumatic synovitis. The procedure would commonly involve 2 long parapatellar incisions, in order to reach all the various regions of the joint. Synovium in the back of the knee was always a problem, and often could not be reached, so the term "subtotal synovectomy" crept into the vocabulary. Essentially, the procedure involved peeling the abnormal synovium from the underlying capsule. Although the outcome usually resulted in some improvement, the postoperative morbidity such as pain and stiffness, plus extended rehabilitation and frequent complications often created major problems for the patient.

It was no wonder, given the morbidity and difficulty in doing a traditional open synovectomy, that interest would be directed towards a radiochemical synovectomy using radioactive materials[1]. Yttrium was commonly used and in some major centers, isotopes such as dysprosium could be manufactured and inserted into a joint fairly quickly so they would not lose too much of their activity because of their short half-life[2]. Radiochemical synovectomies had immense appeal, particularly for use in small, tight, or complicated joints such as the ankle, wrist, or finger joints.

However, in the past 20 years, new techniques and equipment have been developed to allow the performance of a synovectomy of the knee under arthroscopic control, with minimal surgical invasion[3]. The original technique involved a rotating suction shaver, about 4 millimeters in diameter, with an aperture at the end and a rotating blade inside the outer tube. The abnormal tissues would be sucked into the opening, cut off by the rotating blade and removed by suction through the instrument. A fairly complete synovectomy could be achieved with 4 to 6 puncture wounds, allowing entry into various regions of the joint, including the posterior recesses[4].

This type of arthroscopic synovectomy became very useful, and the results were extremely promising. Although technically difficult, it was a rapid way of debulking the joint and removing as much of the abnormal synovium as possible. Sometimes this would be followed by the use of radiochemicals 3 to 4 weeks later, to ablate any small areas or patches of synovial tissue that either were not seen or not totally removed at the time of the original arthroscopy. A word of warning, however, is to avoid following a chemical synovectomy by an arthroscopic synovectomy, as the chemicals tend to sink to the back of the knee, and thin down the posterior synovium and capsule to a point where the passage of an instrument into the posterior compartment might rupture a major vessel. This was the basis of at least one lawsuit.

Newer techniques are exploring the use of various energy sources from the electromagnetic spectrum. The use of lasers, defocused to provide an ablative effect over a large surface area and to avoid deep penetration of the tissues, has produced some interesting results. Again, technical knowledge is extremely important. The surgeon must know not only how to apply the energy, but how much can be used without danger, and so on. In this issue of *The Journal*, Takagi and colleagues describe the use of a holmium-YAG laser under arthroscopic control to perform synovectomy in a very tight joint, the ankle joint[5]. This is the current state of the art in synovectomy techniques and in my opinion is much more efficient than any previous open operative or radiochemical procedure. Lasers can reach the farthest corners of tight joints, and therefore work in areas that no instrument can reach. Also, the procedure can be stopped as soon as the desired ablative effect is achieved — something that cannot be done with radiochemical techniques.

More recently, radiofrequency devices with long wavelengths and alternating current that oscillates the electrons

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and produces molecular friction resulting in heat and tissue denaturation are being explored. Regardless of the technique, the concept is to reduce the bulk of the abnormal synovium, thus decreasing pain and reducing the swelling. Also on the horizon are techniques involving chemicals that are delivered directly to the synovium, then activated by light at a specific wavelength, with the result being destruction of the target tissue. While still experimental, photodynamic synovectomy may ultimately prove to be very useful[6].

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