

Why are we so fixated on the disc?

The term "internal derangement" was first used by Sir Astley Cooper in a treatise on bone and joint surgery dated 1846. He described an orthopaedic meniscus dysfunction. In 1887 Annandale reported in the journal *Lancet* surgery he had performed to treat the meniscus (disc) of the temporomandibular joint in a patient with internal derangement. This was the first report in the literature utilizing that term in reference to TMJ.

For the next 50 years the subject of TMJ internal derangement was discussed in the literature as the cause of TMJ pain and dysfunction. The disc was deemed the culprit because it was out of position. Therefore, it must be repositioned surgically or removed completely, and then patients would be free of pain.

Costen claimed in the 1930's to have identified a syndrome describing pain associated with TMJ. His landmark paper appeared to put to rest, at least for awhile, the concept of internal derangement, because now the culprit was no longer the meniscus, but dental units (teeth), more precisely the posterior lack thereof. He ceded the problem to dentistry, where it found its home, TMJ, "the mouth joint."

Therapy for the painful TMJ, as well as facial pain in general, was at this point placed in the hands of dentists who quickly lost interest in the orthopedic and surgical concepts of internal derangements. Additional terms, which competed for attention were condylar position, malocclusion, and over-stretched masticatory muscles, among others.

Lazlo Schwartz introduced another variable into the fray in the late 1950's, that being the psycho-psychologic theory of facial and TMJ pain. This concept was refined by Laskin, who introduced the term MPD or Myofascial Pain Dysfunction Syndrome into the literature. This confounded the occlusionists, who were at the time the dominant therapists. The concept of the psyche having an effect on the anatomy was difficult for practitioners to deal with. They were accustomed to assigning a mechanical reason to causes for pain.

There were, however, a few brave surgeons who still believed that surgeries such as high condylectomy, condylotomy, or menisectomy were the procedures of choice during the 1960's. For the most part, the dental profession continued to practice those procedures with which they were most comfortable, those being involved with teeth and plastic (splints).

It became obvious to the dental profession in the 1970's that the problem of TMJ and facial pain was much more complex than had been realized. All the enamel grinding and prescribing of Valium was not solving the pain problem satisfactorily, despite all the literature extolling these mechanical treatment approaches. They decide there must be a key factor missing in the equation. They had been taught that in dentistry there is always a direct cause-effect relationship for a problem. For example, bacteria causes caries

(tooth decay), oral hygiene habits cause periodontal disease, non-restorable teeth cause pain, and the solutions to these “problems” are always mechanical. Caries is treated with fillings, periodontal disease with gingival therapy, such as scaling and gingivectomies, and non-restorable teeth are extracted. Applying this mindset to the problem of TMJ and facial pain would lead one to observe the effect, determine the cause, treat the problem mechanically, and expect the problem to be resolved. This simplistic mechanical approach to solving problems led to the “rediscovery” of disc displacement as the mechanical cause of all TMJ problems, unrelated to any true pathology. The concept was even extended to include chronic headaches, athletic prowess and even to sexual function or dysfunction.

The concept of internal derangement fit perfectly into the mechanical mindset. The disc belongs on top of the condyle; because that’s the way it was represented in the anatomy text and in all associated articles.

Thus the forgotten art of arthrography, with its attendant problems of inducing a non-physiologic condition that had not previously existed, was resurrected. The concept could now be legitimized on film. Imaging techniques became more sophisticated, further displaying the displaced disc. CT scans were touted in the literature and at professional meetings, until it was realized that the image, which supposedly displayed the “culprit” disc, was really just background “noise.” Along came the MRI, a new non-invasive imaging tool, which was used to further condemn the disc as the cause.

Non-surgeons started their quest for recapturing the displaced disc with plastic anterior repositioning mandibular splints. Mandibular occlusal repositioning appliances were two of the mainstay artillery pieces in this non-surgical war on the disc. Mandibles were moved forward, teeth were orthodontically repositioned, or were covered in gold or porcelain in order to accommodate the new jaw position. Patients were pronounced, “cured” in anecdotal literature. Whole new institutes were dedicated to the recapture of the disc and the resultant occlusal discrepancies.

I always imagine a group of men in dental smocks, running madly through a field armed with acrylic, wire nets, trying to recapture a swarm of killer bees that have escaped the hive, and who are threatening the lives of innocent women, when I hear the term “recapturing the disc”.

Surgeons quickly picked up the concept. Often the plastic (splint) “artillery” was ineffective in dealing with the culprit disc, especially in the chronic headache patient. Surgical “strikes”, which would directly attack the disc, were necessary, in order to capture it with suture and return it to its rightful and proper position on top of the condyle. Then all would be well. The surgical literature was dominated in the late 1970’s and early 1980’s by descriptions of various techniques to accomplish this noble task. There were even newer “weapons” introduced, such as the alloplastic disc implant (Proplast-Teflon), which was employed before even being fully tested. This created even more

problems. It was deemed necessary to exorcise the “demon” of the culprit disc at all costs. A whole generation of discs was condemned and annihilated by this “weapon”, which later proved to cause massive bone destruction.

In the mid 1980's a new weapon was introduced, the arthroscope. This, along with the advances in imaging technology, opened new vistas in the area of the internal structure and function of the temporomandibular joint. Now, for the first time, the joint function could be directly observed without having to cut into it. Some of the same criticisms that had been raised in relation to the non-physiologic causes were now repeated in relation to arthrography. This is proper. However, it must be said that arthroscopy has probably opened the door to more scientific analysis of the TMJ and its disc, its function and dysfunction, than any tool that has been developed thus far.

However, the arthroscope and MRI have proven to be double-edged swords. They revealed displaced discs not only in symptomatic patients, but also in asymptomatic volunteers, as well as in the asymptomatic contralateral joints of the symptomatic patients. They also proved that the anterior repositioning splints and disc repositioning surgeries not only did not reposition the disc, but in many cases actually caused the disc to be further anteriorly displaced, even in patients who had been considered cured. Cadaver studies further confirmed disc displacement or internal derangement as the source of TMJ and facial pain problems.

The accumulated scientific evidence in 1990's appears too be showing that the disc, by itself, is not the sole culprit in TMJ and facial related pain, even when it is positioned off the condyle. In fact, quite the opposite appears to be true, that is, that the further anteriorly displaced the disc is, the better the patient feels. Additionally, many of the interarticular problems can be associated with interarticular fibrosis and the release of enzymes, which mediate pain, as well as intra-articular muscle fatigues and spasms.

So, where do we as surgeons who must deal with the TMJ, stand now? First and foremost, we must get back to the planning of basic treatment and making the proper diagnosis. Patients who present with vague, non-specific, non-joint-localizable, non-functional, chronic pain, especially those with long-term headaches, are not primary TMJ surgical candidates. If we, as surgeons, could eliminate one group of patients from our surgical practices, this would be the group. You cannot operate on the TMJ of such patients and eliminate their chronic pain. The pain is not coming solely from their joints. As you can tell from the previous discussion, it is also not coming completely from a disc displacement. There are extra-articular factors involved, which have great etiological significance for these patients. Among these are sympathetic vascular pain, myofascial pain as a result of myospasm, and chronic depression manifested as facial pain.

The bottom line in the diagnoses for surgical treatment of the TMJ should be “if it isn’t broken, don’t fix it”. If we, as surgeons, would heed that one adage in dealing with these patients, we wouldn’t have the numbers of TMJ repeat surgery patients we now find ourselves dealing with in the 1990’s.

These patients not only continue to have their original pain, but have actually been made worse. They also have significant functional and esthetic problems as a result of the multiple surgical procedures they have undergone in an attempt to deal with the elusive “killer bee disc”. We must also read our literature carefully and consult the orthopaedic literature, since this joint obeys the same principles as other body joints, regardless of what the old dental literature preached. Researchers in this area must strive to find commonalities, rather than spend time and resources trying to discern differences between the TM joint and other joints in the body. We must carefully analyze new techniques and materials utilized in the treatment not only of TMJ, but also in all of our other surgeries to be sure that they are physiologically and biologically sound in addition to having been scientifically tested. Lastly, we must obey the first rule of surgery, “Primum non nocere” – first, do no harm.

Louis G. Mercuri, DDS, MS