Anderson
Hand Therapy

DUPUYTREN'S DISEASE; THE UNKINDEST CUT?

In September of last year, I was asked by a rheumatologist who runs a medical research group if I would be willing to assist in the trial of a drug that would be used to treat Dupuytren's disease (DD). I was familiar with closed and open surgical releases, but had not heard of non-invasive treatment like this. This report then is in effect an extended and informal journal review that discusses the varied management options for this disease.

History of Dupuytren's Disease

Dupuytren's disease was first reported in medical literature by Plater in the 17th century. Baron Dupuytren is credited with the first surgical release on the 12th of June, 1831. He was able to demonstrate that the deformity of the hand associated with the disease is due to the retraction of the palmar aponeurosis.

Treatment is usually surgery with its associated complications including but not limited to CRPS, oedema, post-operative stiffness, significant scarring, pain, and reduced hand function. Metacarpal joint contractures respond better than PIP joint contractures of which less than 25% are completely corrected. Recurrence rates do vary from 26% to 80%, however the number of patients that require further surgery is around 10%. (This includes my mum who has had 3 bites of the cherry!)

Surgical Intervention

There are several different methods used in surgery for DD. Surgical treatment can be either open or closed. McCash described the *open-palm technique* in 1964. A distinct benefit of this method is that it allows early mobilisation. The movement that is usually introduced on post–operative day one can help to minimise oedema, reduces the risk of haematoma, and can lessen post-operative pain. Patients do need to be well educated given the appearance of the wound in their palm, and the need to maintain motion as the wound heals over.

A *fasciotomy* sees the diseased cord cut or divided with or without direct vision. A relatively minor procedure performed under local anaesthetic, full motion is regained quickly. It works well for MP joint contractures and in older patients who are unlikely to see recurrence of the disease.

Regional fasciectomy removes only diseased fascia, and is most suitable in the palm over the ring and little finger rays. An *extensive fasciectomy* is more involved and sees removal of diseased and potentially diseased tissue. This is most usually seen in the finger where neglect of certain fascial structures can see recurrence. Understandably, this method does have greater risk of complication, and the therapy required is more intensive.

In 1965 Hueston advocated *dermofasciectomy* to avoid recurrent contracture especially at the PIP joint. In this procedure, the diseased fascia and the skin overlying it is removed and replaced with a full thickness skin graft. Recurrence of disease has been shown to rarely occur deep to a full thickness graft, and functional results are similar to standard fasciectomy.

Needle Aponeurotomy

Needle aponeurotomy (NA) is a minimally invasive procedure developed in Paris by Dr. Lermusiaux in the early 1950's and has been in use in France for the past 30 years. I am not aware of any hand surgeons using this technique in Melbourne however several patients have asked about it as it is well represented on the Internet. Under local anaesthetic, the surgeon uses a small hypodermic needle to divide and sever the contracting bands in the diseased areas of the palm and fingers.

NA is reported to be most effective for disease in the palm of the hand where well-defined cords are present. It is not considered appropriate if the skin is tethered or the disease is diffuse. Proponents of this method report little need for postoperative hand therapy, and a rapid return to previous activity. Scarring is minimal, and if the contracture returns, the ½ to 1-hour process can be repeated. However there is still a 58% recurrence rate, and 24% reoperation rate associated with this procedure, similar to standard surgery.

Conservative / Nonsurgical Intervention

There have been many conservative treatments trialled over the years including vitamin supplements and creams, ultrasound, steroids, radiation and anti-gout medication. None have been able to demonstrate any success, and some such as extension splinting can perhaps hasten the disease process.

Enzyme fasciectomy was first used by Bassot in 1964, and Hueston repeated this in 1971. His immediate results were excellent however he did not provide any followup. McCarthy also trialled this approach, however he felt that the recurrence rate of 75% at 2-3 years post indicated no significant advantage over surgical intervention.

Current Research

Badalamente (2000) used clostridal collagenase injection as a non-surgical treatment for DD. It is the phase 3 extension of this study that I am involved with. Clostridal collagenase is the specific enzyme for collagen which is why the authors felt it might have better long term results than previous, non-specific enzyme fasciectomy. They theorised that the enzyme would break down the diseased tissue to the point where passive force would be sufficient to break the cords and permit full range of motion.

Method: The experiment saw 35 patients injected with collagenase. Ultrasound was used to identify a “safe zone’ between the tendon and the cord. The next day, the patients were seen, and an attempt to rupture the cord was made using brute force! If rupture did not occur the patients were instructed to apply the force themselves at home. Repeat injections were given 4-6 weeks after the first if rupture did not occur.

Once rupture was achieved, the patients were fitted with an extension splint for night that they wore for 4 months. All patients were instructed in massage with vitamin E, and

extension exercises. No major adverse outcomes were reported. Minor reactions included haematoma, tenderness over the site, and oedema.

Results: Results were promising, hence the progression to a stage 3 trial. 82% of the MCP joints (n=34) treated achieved full extension. 44% of the PIP joint contractures (n=9) had full motion. Recurrence was seen in only 3 fingers at 2 year follow-up. There was no mention of the type or severity of DD seen in this study. I would assume that this method would not be as effective with diffuse or nodular DD. I am also curious as to the status of the tissue post injection. I don't know whether it simply dissolves, or whether it remains as a gluggy mass waiting to harden.

The trial I have been involved in is a stage 3, double blind, randomised, placebo-controlled study. Testing centres are spread over several countries, and many cities. I have directly treated 4 patients and 5 hands. All patients had primary involvement of their MCP joints. I saw them immediately following the rupture of the cord. My role was to provide the patient with a palmar hand based extension splint (all joints in neutral), to be worn at night for 4 months. I also educated them in massage, and flexion / extension exercises. I did not see them for follow-up visits, and all measurements were taken by a nurse.

Discussion

Whilst I am not in a position to comment as to long term results, I can say that I was amazed by the amount of movement they had. All could achieve full active extension without pain. All patients were very positive about the experience despite the aggression required to achieve this movement. One patient did have tearing of the skin over the injection site. This wound healed quickly, and he came back 2 months later to have his left hand injected. Currently the clinical trial has been paused awaiting more vials of the collagenase.

Discussions with surgeons about this trial and method reveal different levels of enthusiasm to that expressed by potential patients. Patients are very interested in a method that provides good motion without surgery whether it be injection or NA. The decreased time off from work, lack of need for follow-up therapy, and potential to resume previous functional status sooner is attractive.

Surgeons are concerned by the lack of long term results, and have questions about the effect the enzyme may have long term. I do not know why NA is not performed by local surgeons. If it is, perhaps it is because these patients don't need hand therapy which is a bad thing for my business! There are definite risks associated with the injection of a needle with or without collagenase should it miss the cord and contact tendon or nerve. The study I am involved in does not use ultrasound to provide information on tendon position, a feature that did concern at least one surgeon I spoke with.

It does appear that there are now options to consider beyond surgical fasciectomy. There is certainly growing awareness in the general public of these options, and whilst we may still be some way off any definitive results, it is certain that invasive surgery is being challenged as a first line management option.

Further Reading / References

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