Regenerative injection therapy (Prolotherapy)

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Evolution

“A joint is only as strong as its weakest ligament” George Hackett, MD

Objectives
- Scientific Evidence
- Proliferants
- Applications
- Complications
- Outcome
Prolotherapy

“The rehabilitation of an incompetent structure, such as a ligament or tendon, by the induced proliferation of new cells.” Webster Dictionary
Proliferants

- Growth factors:
  - Platelet Rich plasma
- Engulfed Particulates:
  - Pumice
- Irritants:
  - Ongley’s solution
  - 2.5% Phenol, 25% Dextrose and 25% Glycerol
- Chemotactics:
  - Sodium Morrhuate 5%
- Osmotics:
  - Dextrose 15% to 25% mixed with Lidocaine.

Platelet Rich plasma

“PRP is defined as a tissue graft incorporating autologous growth factors and/or autologous undifferentiated cells in a cellular matrix whose design depends on the receptor site and tissue regeneration” David Crane

Tibial tarsal bone

- Marked increase in bone
- Marked increase in soft tissue
- Strong fibrooseous union
Rabbit tendons

- Increase of tendon diameter by 40%.
- Attachment of the ligament to the bone, which has increased 30%.

Applications

- Ligamentous laxity
- Tendinosis
- Osteoarthrosis
- Hypermobility

Hypermobility (Beighton Score)

- Extend little finger > 90 degrees (1 point each side)
- Bring thumb back parallel to touching forearm (1 point each side)
- Extend elbow > 10 degrees (1 point each side)
- Extend knee > 10 degrees (1 point each side)
- Touch floor with flat of hands, leg straight (1 point)
- Hypermobile = 6 or more
Pathogenesis of Osteoarthrosis

- Local inflammation of the injured ligament or tendon is necessary to heal sports injuries.
- NSAIDs and Steroids inhibit the enzymes that block the production of prostaglandin and Leukotriens, which mediate inflammatory process.

Degeneration, inflammation or.. Neuropathy!!!

The Z joints

- Case series on chronic whiplash related neck pain treated with intrarticular Zygapophysreal joint regenerative injection therapy (Hooper, 2007)
- Therapeutic cervical medical branch blocks (Local anesthetics) in managing chronic neck pain pain (Manchikanti, 2006)
- Cervical facet joint injections (steroids) in the neck and shoulder pain (Kim, 2005)
Hackett referral pattern

Sacroiliac Joint (3 D's)
- Diagnosis
- DonTigny
- Dextrose (Prolotherapy)

Sacroiliac joint
DonTigny

Intradiscal Restorative injection

Spinal Stenosis

“A little less science, gentlemen, and a little more art!” Trousseau
Spondylolisthesis  Barre-Lieou

Prolotherapy versus Fusion

<table>
<thead>
<tr>
<th></th>
<th>Preserved</th>
<th>Abolished</th>
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</thead>
<tbody>
<tr>
<td>Joint motion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>Eliminated</td>
<td>May continue</td>
</tr>
<tr>
<td>Collagen growth</td>
<td>Enhanced</td>
<td>Inhibited</td>
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<tr>
<td>Tendon strength</td>
<td>Enhanced</td>
<td>Inhibited</td>
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<tr>
<td>Ligament strength</td>
<td>Enhanced</td>
<td>Inhibited</td>
</tr>
<tr>
<td>Results</td>
<td>80% cure</td>
<td>Variable</td>
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</tbody>
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Temporomandibular joint
MCL Ligament  Coronary Ligament

Knee  Hip

Ankle  Deltoid
Peroneal

Plantar

Lateral ligament

Achilles

Complications

- Pain
- Needle trauma
- Arachnoiditis
Complications

- Sterile meningitis after lumbosacral ligament sclerosing injections
  Journal of Orthopaedic Medicine, 1994, Grayson

- Complications following injections of sclerosing agent to precipitate fibro-osseous proliferation
  J Neurosurgery, 1961, Hunt, Baird

- Paraplegia from treatment with sclerosing agents
  JAMA, 1960, Keplinger, Bucy

- Fatality after injection of sclerosing agent to precipitate fibro-osseous proliferation
  JAMA, 1959, Schneider, Williams, Liss

Evidence based medicine

- "In this age of accountability it is imperative that therapies with questionable benefits be critically evaluated" Kepes, 1985

- "Do not put your faith in what statistics say until you have carefully considered what they do not say" Watt, 1964

Reference Type: randomized clinical trial

- A randomized, double-blind, placebo-controlled trial of sclerosing injections in patients with chronic low back pain
  Rheumatology (Oxford), 1999, DeChow, Davies, Carr, Thompson

- A randomized double-blind trial of dextrose-glycerine-phenoxy injections for chronic low back pain (abstract only)
  First International World Congress on Low Back Pain and its Relation to the Sacroiliac Joint, 1992, Klein, Eik, DeLong, Mooney

- A randomized double-blind trial of dextrose-glycerine-phenoxy injections for chronic low back pain
  J Spinal Disord., 1993, Klein, Eik, DeLong, Mooney

- Low back and sciatica: controlled trials of manipulation, traction, sclerosant and epidural injections
  Br J Rheumatol, 1987, Mathews, Hills, Jenkins, Grimes, Morkel, Mathews, Scott, Stittamisn

- A new approach to the treatment of chronic low back pain
  Lancet, 1987, Oniguy, Klein, Dorman, Eik, Hubert

- Randomized, prospective, placebo-controlled double-blind study of dextroamphetamine for osteoarthritis of the knee (IIP, IPP, and transversebipartition) knee, evidence of clinical efficacy
  J Altern Complement Med., 2000, Reeves, Hassanam

- Randomized prospective double-blind placebo-controlled study of dextroamphetamine for knee osteoarthritis with or without ACL laxity
  Altern Ther Health Med., 2000, Reeves, Hassanam

- Prolotherapy injections, Raline injections, and exercises for Chronic Low Back Pain: A Randomized Trial
  Spine, 2004, Yeatman, Glassen, Bodeau, Schuler, McKennan
Are you totally lost?

- www.pronews.com
- www.camresearch.com
- www.aamend.org
- www.benuts.com

Outcome?

“To find health should be the object of the doctor. Anyone can find disease.” A.T. Still

Integrative medicine

“Complementary and alternative Medicine (CAM) is defined as therapies that are neither taught widely in Medical schools nor generally available at United States hospitals, CAM + Conventional Medicine = Integrative or Holistic Medicine” Eisenberg 1996