

PROLOTHERAPY

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PROLOTHERAPY

- Prolos- To stimulate growth
- Prolotherapy involves the injection of irritant solutions into weakened or stretched ligaments which are a source of chronic pain

PURPOSE

- Stimulate a limited inflammatory response, which mimics the normal repair sequence
- Trigger the healing cascade
- Increase fibroblastic activity & collagen deposition
- Strengthen ligamentous structures
- Strengthen the enthesis (ligament or tendon insertion on the bone)
- Relieve pain

- Hippocrates described the insertion of hot needles into tissue
- Amenhotep III (Egypt) “...giving fire to his horses”

Treatable Conditions

- Pain arising from ligaments
- Enthesopathy
- Tendonosis
- Spondylolisthesis
- Facet Arthropathy
- Degenerative Disc Disease
- Instability
- Chronic Joint Sprains

Treatable Conditions

- Knee Pain
- Ankle Sprains
- Back and Neck Pain
- Foot Pain, Plantar fasciitis
- Headaches from Whiplash
- Rotator Cuff
- Tennis and golfers Elbow
- Wrist Pain and Carpal tunnel
- Osgood-Schlatter Disease
- Sports Injuries
- TMJ

WOUND HEALING

- Early and late inflammation lead to granulation tissue
- Granulation tissue is rich in fibroblasts and mononuclear cells which result in healing
- Process of matrix deposition and remodeling
- Collagen accumulates during a period of months, giving added strength to the injury

Early Inflammation is needed for healing to occur

- Anti-inflammatory agents may interfere with the healing cascade

How does Prolotherapy work?

- Initial injury: mechanical needling and proliferant solution
- Inflammatory cascade within 6 hours
- Granulation tissue present by day 3
- Fibroblasts are depositing pre-collagen by weeks end
- Over the next 3-12 months collagen remodeling occurs with the resulting repair of the soft tissues

Needle Trauma

- Cell membrane disruption
- Release of lipids, which are naturally inflammatory
- Signals macrophage and fibroblast activity
- Micro bleeding from bone result in elevation of growth factors for connective tissue growth.

Proliferant Solutions

- Irritants
 - Phenol
- Particulates
 - Pumice
- Osmotic shock agents
 - Dextrose
- Biological
 - Platelet-Rich Plasma
 - Stem Cells
- Natural Growth Factors
 - homotoxicology

Platelet-Rich Plasma

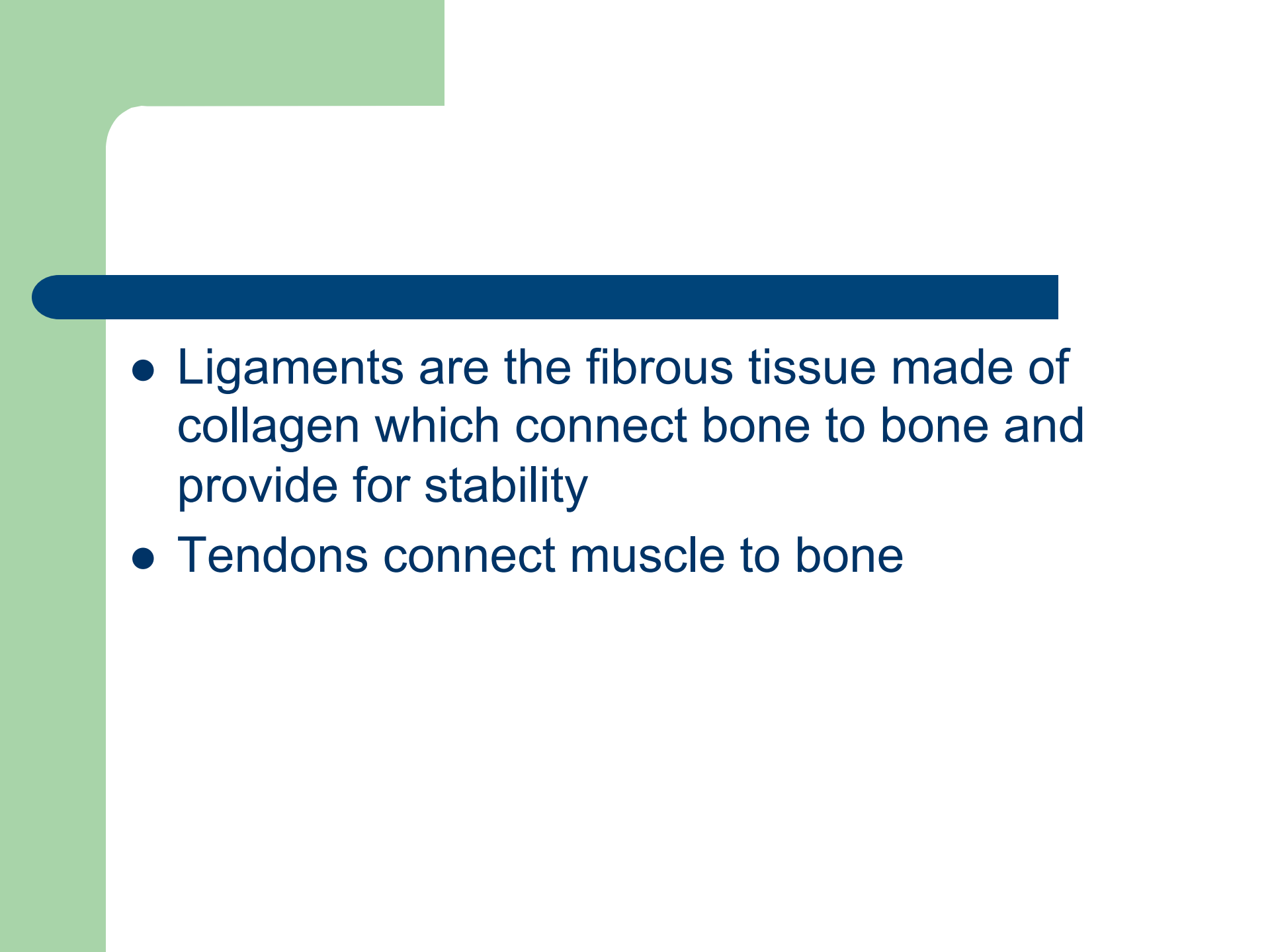
- Autologous Platelet-Rich Plasma is a biotechnology that involves the injection of a small volume of the patients own plasma directly into the site of the injury

Indications

- Pain arising from ligaments
- Enthesopathy
- Tendinosis
- Pain with increased activity; tendinosis
- Pain with prolonged positioning; postural
- Ligament sprain with persistent joint dysfunction or palpable laxity

Ligament Laxity

- Popping, cracking
- Grinding sensation
- Recurrent somatic dysfunction or subluxation
- Numbness and pain in a non-dermatomal pattern
- Temporary benefit from bracing and or manipulation

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- Ligaments are the fibrous tissue made of collagen which connect bone to bone and provide for stability
 - Tendons connect muscle to bone

- *Prolotherapy* is a method of injection treatment designed to strengthen “the weld of disabled ligaments and tendons to bone by stimulating the production of new bone and fibrous tissue cells...”

George S. Hackett, M.D.

Patient Selection

- Thorough history and physical
- Completed conventional program

Contraindications

- Immunocompromised patients, smokers, poor nutritional status
- Insufficient trial with more conservative treatment
- Needle phobia
- Allergy to proliferant solution

Does it work?

- Hackett 1958, described treatment with proliferant. Improvement rate of 82% in 1600 low back patients
- Ongley, MJ. Et al, Lancet 1987 Blinded study, 6 weeks of injection and manipulation. 35/40 patients with 50% improvement at 6 mo.. 19/41 control, 15 prolo patients disability free, 4 control

- Klein, J of Spine Dis, 1993 Randomized double-blind. 30/39 50% improved, 21/40 xylocaine
- Liu, King, animal studies
- Dorman, T, Spine 1995, State of the art review

Yelland, Spine 2004

- 110 participants
- Average of 14 years duration low back pain
- Followed for 2 years
- Average 7.1 injections
- Average 7.3 injection sites
- Average 23.6 volume injected

- The prolotherapy group had a 50% reduction in pain and disability at 12 mo
- “ Significant and sustained reductions in chronic low back pain and disability were observed with glucose/lidocaine injections for 2 years.”

Vert Mooney, MD Professor of Orthopedics UCSD.

- “ I became involved with a prospective randomized double blind study in otherwise healthy people with chronic back pain and pelvis pain. This was the best clinical study in which I had ever been involved...The study was described by the editor of the journal Spine, as an “elegant study”. It clearly documented the benefits of prolotherapy over injection of local anesthesia.”

Topal, Arch Phys Med Rehab 2005.

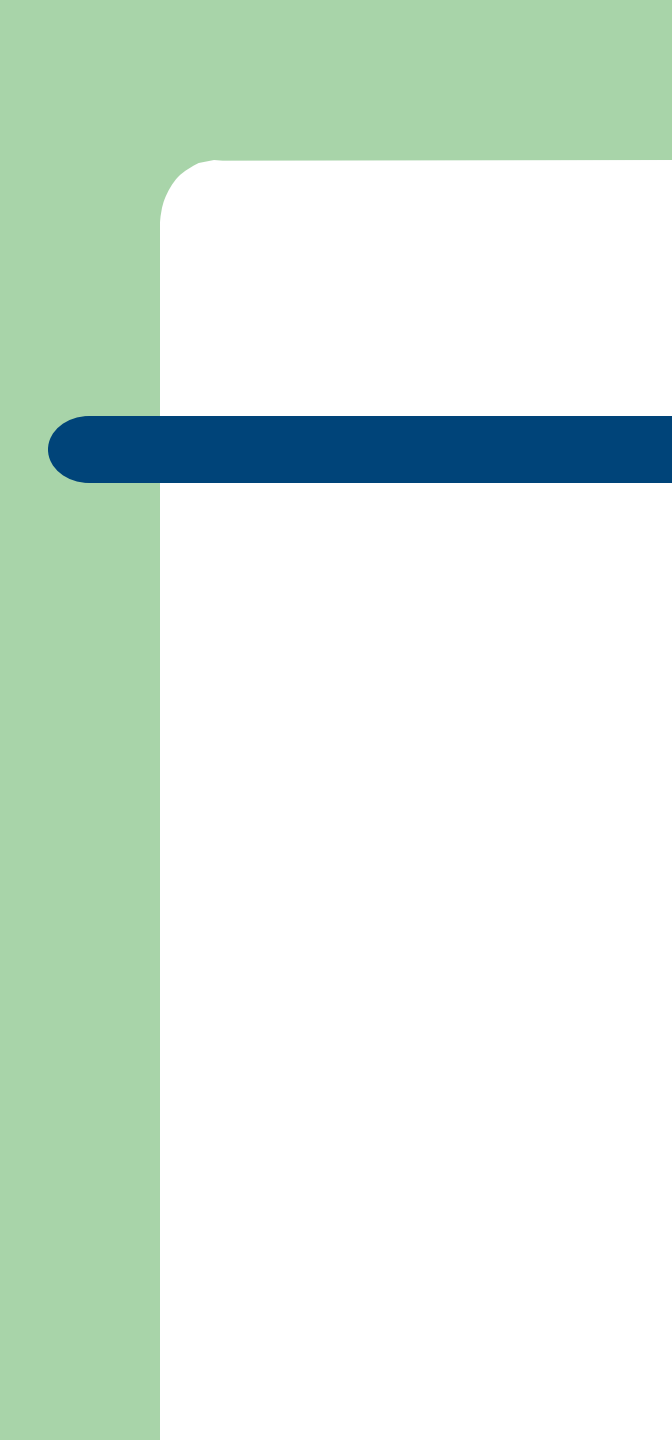
- Dextrose prolotherapy showed marked efficacy for chronic groin pain in elite rugby and soccer athletes.
- Mean of 2.8 treatments to the groin.
- 20/24 no pain at 17 months.
- 22/24 unrestricted in sports.

Rabago, Annals of Family Medicine 2013

- Dextrose prolotherapy showed statistically significant improvement in motion, stiffness and pain of Osteoarthritis of the knee for 52 weeks
- Follow up data with improvement at 131 weeks

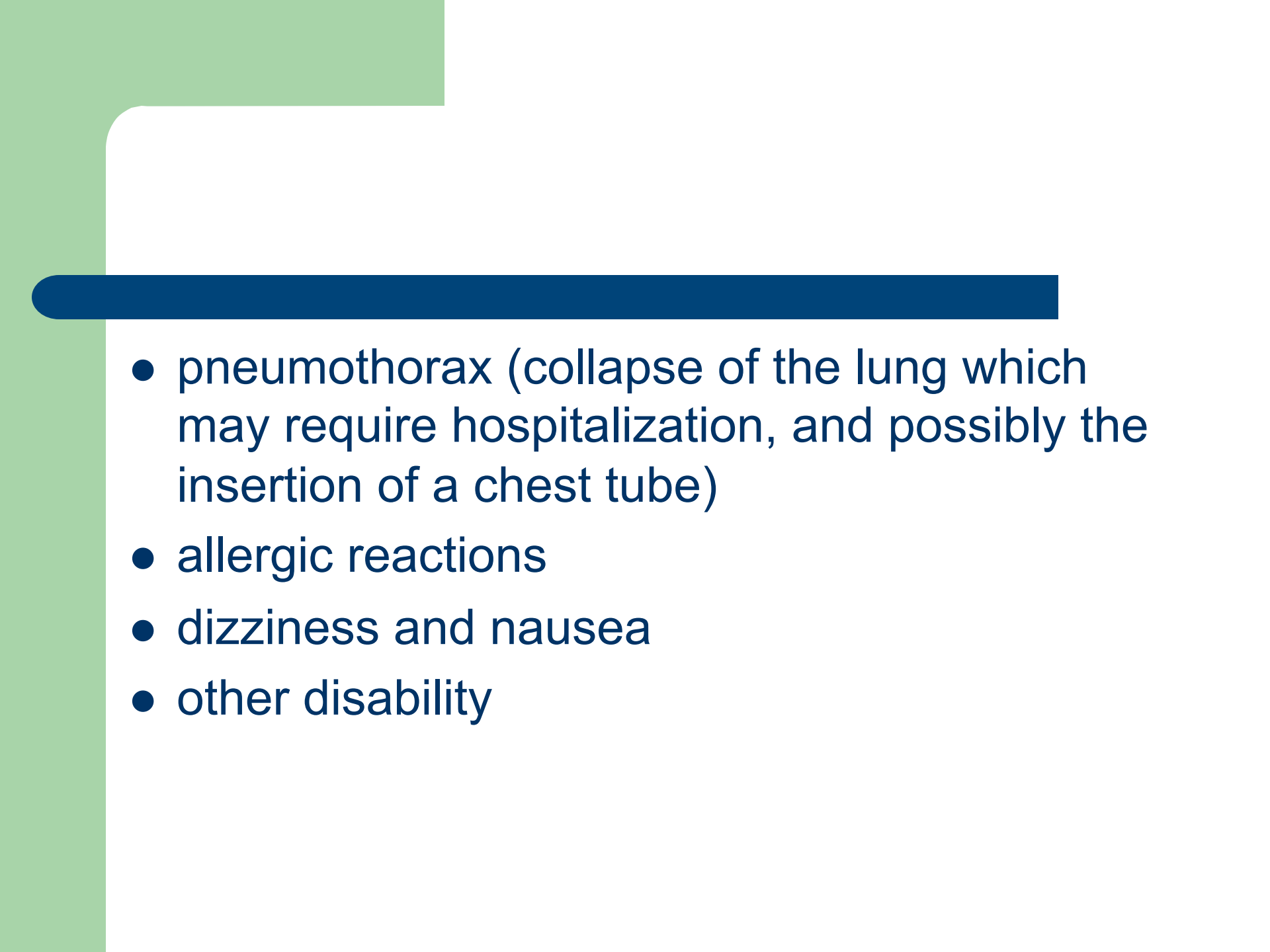
Cole, American Journal of Sports Medicine 2017

- Significant improvements were seen in PRP over Hyaluronic Acid for knee Osteoarthritis
- Decrease in 2 proinflammatory cytokines



Complications, less than 1%

- increased pain
- permanent numbness
- scaring
- infection
- abscess
- weakness
- spinal headache

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- pneumothorax (collapse of the lung which may require hospitalization, and possibly the insertion of a chest tube)
 - allergic reactions
 - dizziness and nausea
 - other disability

- There is the possibility of complications due to the injection of anesthetic, drug reactions, or other factors, which may involve other parts of your body, including the possibility of brain damage, death, heart attack and stroke

Alternatives to Prolotherapy

- Physical Therapy
- Manual Medicine
- Injections
 - Steroids
- Drugs
 - Pain meds
 - Anti-inflammatory
- Surgery
- Exercise
- Live with the pain

PHYSICAL THERAPY & MODALITIES

- Only 7 of 22 trials using physical therapy and modalities were more efficacious than placebo.
- Feine & Lund, Pain, 1997

MANUAL MEDICINE

- Favorable in 53% of studies
- Positive effects after 3 months in 48% of studies
- Koes, Spine, 1997

INJECTIONS

- Epidural corticosteroids do not reduce the need for surgery or improve function.
- Similar findings found for facet joint injections
- Crette, NEJM, 1991, 1997

DRUGS

- NSAIDS
- GI toxicity is 20%
- Life threatening bleed is 1-3%
- Tannenbaum, Can. Med. Assoc.. j

SURGERY

- Permanent
- May not fix the problem
- Need for further rehab
- Can always consider if Prolotherapy doesn't work
- Last resort

Schedule-dextrose

- Injections done every 3-6 weeks
- Average 4 sets for arms and legs
- Average 4-8 sets for back

Schedule-PRP

- Injections done every 8 weeks
- Average 1-3
- Results seen average 8-12 weeks
- 10-20% non-responders

Aftercare

- No anti-inflammatory products for 5 days prior to injections
- No anti-inflammatory products for 5 days after injections
- Post PRP rehabilitation protocol.

- May use Tylenol products
- Lidoderm patch
- Normal medications
- Medications from Dr. Berenbeim
- Light activity to tolerance for 3 days for dextrose
- Immobilization or crutches for 3 days for PRP

Optimal Results

- Zinc 30-50 mg/day
- Vitamin C 1000-2000 mg/day
- Glucosamine Sulfate 1500 mg/day
- Adequate protein intake, may add protein bar
- Calcium additional 600 mg/day for 7-10 day
- Vitamin D3 4000 iu/day

Prolotherapy

- An elegant
- Effective
- Safe
- Cost effective
- Way to treat chronic pain

Thank You

