Surgical and Post-Op Management of Hallux Valgus

There are well over 100 surgical procedures described in the literature to address disabling hallux abductovalgus deformities. This plethora of procedures would certainly indicate that there is no single operation that is perfect for everyone or addresses the unique presentation of each patient. It is important for the physical therapist to have a general understanding of the different surgical procedures as they will influence the course and design of the post-operative rehabilitation.

Generally speaking, the type of surgical intervention is dictated by the congruency of the joint, the amount of degenerative change, and the intermetarsal and hallux valgus angles that are present (see algorithm below). Normally, the intermetarsal angle should not exceed 9° and the metatarsophalangel hallux valgus angle (representing the lateral deviation of the 1st phalanx) should be no more than 15°.

For the patient under 50 years of age with a congruent joint and hallux valgus angle (HVA) under 25° and intermetarsal angle (IMA) less than 12° an Akin procedure is usually performed. This involves an excision of the medial prominence followed by a medial, closing wedge osteotomy at the base of the proximal phalanx. The patient has the foot firmly bandaged for 6-8 weeks with ambulation in a post-op shoe to tolerance ….. (continued on next page)
Post-Surgical “Bunion” Rehabilitation continued ...

allowed after a few weeks. If the patient is younger than 50 and the HVA is a little larger the surgeon may elect to perform a Chevron procedure. Along with the medial prominence excision and pinning of the osteotomy site a medial osteotomy to laterally displace the distal end of the metatarsal and plication of the medial capsule is performed. Again, this foot is bandaged for 6-8 weeks with progression towards ambulation in a post-op shoe and sagittal plane AROM beginning at 3-6 weeks.

For incongruent joints a soft tissue procedure of the 1st MTP (release of tight structures on the lateral side and plication on the medial side) along with a proximal osteotomy of the 1st metatarsal may be necessary. Adding the osteotomy allows for correction of an excessive IMA of up to 25˚ and HVA of up to 50˚. There are a variety of realignment procedures with the most common being a crescent shaped osteotomy at the base of the 1st metatarsal allowing up to 2-3mm of lateral displacement to improve congruency. These patients will be immobilized a little longer and weight-bearing progression may be delayed until 4-8 weeks to allow bony healing. Sagittal plane ROM exercise may begin as early as 3-4 weeks but aggressive manual interventions should be delayed until 6-8 weeks.

For those with significant degenerative changes a surgical arthrodesis may be performed to fuse the joint and eliminate pain. To optimize function, the fusion is performed with single or double screw fixation across the joint in 15-20˚ of valgus and 10-15˚ of dorsiflexion relative to the ground. These patients will be immobilized in a short leg cast for 10-12 weeks and will obviously have some terminal limitations in function with activities like squatting.

Overall, rehabilitation should emphasize control of pain and edema, scar management, and restoration of motion. Specifically, the patient will benefit from mobilization of the 1st MTP, 1st Ray, and talocrural joint through manual therapy and active exercise. Additionally, retraining the intrinsic muscles and toe flexors along with appropriate shoe wear instructions will ensure an optimal outcome.

Question of the Month – Canadian C-Spine Rules

Yes, there are a couple of decision rules to guide the use of cervical-spine radiography in patients with trauma. The two most well known are the Canadian C-Spine Rule (CCR) and the National Emergency X-Radiography Utilization Study (NEXUS) Low-Risk Criteria. The CCR is considered the gold standard because of its higher sensitivity. In a study of over 8000 patients published in the New England Journal of Medicine in 2003 the sensitivity of the algorithm to the right was 99.4%. The specificity was only 45% but the rule is designed to rule out (not in) the need for imaging. The rule is applicable on patients who are alert (Glasgow Coma Scale of 15) and in stable condition but in whom cervical spine injury is a concern.

Is there a high-risk factor necessitating radiography?
• Is the patient > 65 years of age?
• Is there a significant mechanism of injury?
• Are there paresthesias in the extremities?

Is there any low-risk factor permitting safe assessment of ROM?
• Was the patient in a simple rear-end MVA or able to assume a sitting position in the ER or ambulatory clinic?
• Was there any delayed onset of neck pain or absence of any midline cervical spine tenderness?

Is the patient able to rotate the neck actively 45˚ to the left and right?

J.B., PT, - TX

I found the Ottawa fracture rule in the last issue very interesting – are there any similar type of rules for the spine?


Post-Surgical “Bunion” Rehabilitation continued …
Cervicogenic Headache

The Problem
Cervicogenic headache, defined as pain referred from a source in the neck and perceived in one or more regions of the head and/or face, accounts for 15-20% of all chronic and recurrent headaches. Chronic headache sufferers experience limitations in daily function, restrictions in social participation, and emotional distress. Cervicogenic headache can manifest from a variety of structures of the cervical region, in particular the joints of the occiput and upper cervical spine (OA-C3). Major signs and symptoms of cervicogenic headache include unilateral head pain combined with neck pain and loss of neck range of motion. This problem seems to be most prevalent in middle-aged females and almost any pathology affecting the cervical spine has the capacity to cause headache pain secondary to the convergence of sensory input from cervical structures within the spinal nucleus of the trigeminal nerve.

The Intervention
Customized rehabilitation program provided by a Physical Therapist that includes:

- Patient Education
- Manual Physical Therapy including manipulative intervention
- Strengthening of Deep Neck Flexor and Axioscapular Muscles
- Postural and Propropriceptive Exercise
- Self Mobilization Techniques (SNAGs)

The Evidence
Manual physical therapy provides a conservative option for the treatment of cervicogenic headache. The International Headache Society includes C1/2 limited rotation manifested as impaired neck mobility as a diagnostic criterion of cervicogenic headache. In addition to limited range of motion, a forward head posture, weakness in the deep neck flexors (DNF) and weak cervical extensors are often present with cervicogenic headaches.

Manual treatment aimed at the upper cervical spine specifically to increase cervical rotation has been shown to be effective in reducing self-reported headache severity and increasing cervical rotation. Training the DNFs, postural alignment and neck extensor strengthening is important to this population of patients.

Patients with cervicogenic headache that are correctly diagnosed can significantly reduce their headache severity and increase their cervical spine range of motion with manual therapy and a low-load exercise program directed to the upper cervical spine.

Referral Recommendation
Headache patients with tender cervical paraspinal tissue, side locked, hemicranial symptoms in the oculo-frontal-temporal area, and restricted rotation from a flexed position would benefit most from this approach. In particular, patients without a complaint of light headaches have an elevated likelihood for success.

References

...thanks to my Regis University t-DPT classmates for their contributions to this P.I.E.R. on cervicogenic headache - Kevin Jones, Brooke Kennedy, Geoffrey Klein, and Kimberly McCloughan...
The “Clinical Conduit” newsletter is an every other month publication available to any allied health care provider free of charge upon request. Individuals who would like to be included on the email distribution list should contact the editor at mulliganpt@tx.rr.com

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Short Foot Exercise
Balancing exercises are best performed barefoot to maximize the amount of appropriate afferent information entering the sensorimotor system. To ensure the patient is utilizing the intrinsic muscles they have them work on their static and dynamic balancing activities in a “short foot” position. The short foot position is one in which the arch height is maintained or increased and the length of the foot is reduced without utilizing the long toe flexors. If done correctly, the foot will shorten while the toes remain relaxed. Intrinsic foot muscles act as stabilizers to the medial longitudinal arch much like the multifidus and transverse abdominus do in the spine or the rotator cuff does in the shoulder. A lack of intrinsic activity is most easily observed if the navicular bone drops excessively. This lack of intrinsic control puts a greater demand on passive structures like the plantar fascia and decreases the value of the exercise.

First the patient needs to learn to supinate (heighten the arch) without the use of extrinsic muscles in a non-weight bearing position. Monitor the extrinsics and do not let toes flex (patient should always be able to extend toes). As this become easier progress to increasing weight bearing postures. Finally, move to more labile surfaces to work on static balance or add dynamic movements to really challenge the stabilizing muscles of the foot. Most important – just don’t work on balance – work on balance with the foot and arch in the correct position.

Featured Home Study Program
Foot-Ankle Anatomy
In 1998 the Federative Committee of Anatomical Terminology (FCAT) published the new definitive text on human anatomical terminology. This source is endorsed by the International Federation of Associations of Anatomists (IFAA) and replaces the Nomina Anatomica published by the International Anatomical Nomenclature Committee. The new text is entitled Terminologia Anatomica. One of the most interesting changes was the replacement of the term “peroneus” and “peroneal” with “fibularis” and “fibular”. So you no longer have a “peroneus longus” or “deep peroneal nerve” but a “fibularis longus” and “deep fibular nerve”. The rationale for this change is that “fibula” is an unambiguous term that is unlikely to be confused with other parts of the body. For instance, “peroneal” might be confused with “perineal” or “peritoneum”.

You can find a full list of the nomenclature changes relevant to physical therapists in the guest editorial from the July 2004 issue of the Journal of Orthopedic & Sports Physical Therapy.

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