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**Case Study: Gout**

**Introduction**

Arthritis is a term describing more than 100 diseases including localized, systemic and autoimmune processes. Inflammation of the joint is a common symptom. Other organs can also be affected as kidney and lungs. (1) It is difficult to differentiate one form from another and the disease usually causes a chronic condition. It is the leading cause of disability in the United States and limits the abilities of over 18 million adults. (2)

Historically, gout has been called the “rich man’s disease” or “disease of kings” due to its association with certain rich foods and excessive amounts of alcohol. Primary gout, which is responsible for 90% of the cases of gout, is a disorder caused by an elevation of the serum uric acid levels or hyperuricemia. Uric acid is a product resulting from the metabolism of purines and is excreted in the urine. The uric acid crystallizes and is deposited in the joint, tendons and surrounding tissues initiating an inflammatory response. Repeated attacks can lead to chronic arthritis and the formation of hard nodules containing crystalline deposits of urate known as tophi.

This disease is a result of under excretion or over production of uric acid or a combination of both factors. Decreased renal excretion can occur in patients receiving diuretics and in those with diseases that decrease the glomerular filtration rate. Increased production of uric acid can be caused by hereditary factors, obesity or increased dietary intake of foods high in purines as liver, asparagus and sweetbreads. (3)

Gout tends to occur within families, supporting a genetic link of disease susceptibility. People with gout tend to have a relatively high incidence of other diseases that predispose to renal insufficiency, such as hypertension and diabetes mellitus. (4) It is also more prevalent in middle-aged men. One study showed that it was four times more common in men than woman for those under age 65. It is three times more common in men over 65, however, as the prevalence increases for women after menopause. (5,6) The incidence of gout among black men is almost twice that among white men. (7) In the United States there is an increase in the incidence of gout with one study showing an increase from 20.2 to 45.9 per 100,000 from 1978 to 1996. (8) This may be due to increased life expectancy and changes in diet and activity. Risk factors include hypertension, smoking, alcohol consumption, use of diuretics, obesity and diet rich in meat and seafood.

Per the Centers for Disease Control and Prevention there are no statistics for the cost of gout or impact on health related quality of life. It is, however, responsible for 2.3 million ambulatory care visits per year and is responsible for approximately 14,000 hospitalizations for a principal diagnosis of arthritis and other rheumatic conditions. There is a negative impact on quality of life that can be due to other common co-morbidities as renal failure and cardiovascular disease. (9) Mortality rate is very low.

Symptoms include acute pain, tenderness, swelling, redness and warmth. The most common joint involved is the metatarsophalangeal joint of the great toe but gout can also affect the ankle, wrist and elbow. Progression of the disease is not chronic but is typically episodic, unlike most types of arthritis. It is characterized by painful flares lasting days/weeks followed by long periods without symptoms. Progression to a chronic stage can occur that may cause permanent changes in the bone causing limited movement and deformities. There can also be an increased risk for kidney stones.

Medical diagnosis can be determined by an elevated serum urate level of  $>7\text{mg/dL}$  but there are also people with high urate levels that do not develop gout. An X-ray of the joint to look for bony tophi or lesions of the subchondral bone can also be performed. A more invasive test is aspiration and synovial fluid analysis to identify if needle-shaped urate crystals are present.

Treatment initially consists of nonsteroidal anti-inflammatory drugs with diet and lifestyle modification such as weight loss, avoiding alcohol and reducing dietary purine intake. If diuretics are associated with hyperuricemia, medications should be changed. (10) Treatment goals include managing the pain, ending acute flare-ups and preventing future attacks and the formation of tophi and kidney stones.

### **Case Presentation**

The patient was a 56-year-old male who came directly from the physician's office with a diagnosis of left foot pain. The referral for physical therapy requested an evaluation and treatment including provision of an assistive device to address the abnormal gait/limping. The physician also gave the patient a prescription for Indocin (indomethacin), a nonsteroidal anti-inflammatory drug, and an order for lab tests and X rays of the foot and ankle.

### Symptoms/History

Current concern: Patient complained of continual pain over fifth metatarsal for the past two days. Pain was present at rest but even more with weight bearing activities. He rated pain 6/10 at rest and 10/10 with walking. There was no trauma but he had started riding a stationary bike to help lose weight.

Past medical history: Patient was 50 pounds overweight and reported a history of high blood pressure and high cholesterol. He was on medication for both of those problems: Altace (ramipril) and Lipitor (atorvastatin). He was a plumber, Caucasian and sedentary until starting to ride a stationary bike in the past month. He did not smoke or drink alcohol.

### Assessment

Patient had mild swelling of left mid foot as compared to right foot and increased warmth to touch but no redness or bruising. There was tenderness over the left fifth metatarsal to moderate palpation and with gentle passive mobilization of that metatarsal with anterior/posterior glides. Active range of motion was slow but within normal limits. Strength with traditional non-weight bearing manual muscle testing was within normal limits. Gait analysis showed very short stance time on left lower extremity and slow dorsiflexion for swing-through on that side. Timed up and go was 40 seconds with

difficulty with his walking path and turning. Patient goals were to decrease pain, improve mobility and return to work.

### Treatment/Intervention

Patient was fitted with a single point cane and educated in proper use on level surfaces, inclines and stairs. He was instructed in gentle active range of motion and given an individualized written/illustrated handout of the exercises.

On his second physical therapy visit (four days after the initial evaluation) the patient had pain levels of 2/10 at rest and 3-4/10 with walking. He reported that he was diagnosed with gout as his lab results showed elevated uric acid levels and the X ray showed mild lesions around the fifth metatarsal bone. (Specific lab and radiological results were not available) He had been taking his anti-inflammatory medication, was able to work and was pleased with the improvement of his condition. With further discussion the patient stated that he had a similar sudden onset of severe pain in his right great toe six months ago. It went away with over the counter pain medication and he had no further concerns at that time. He was currently concerned, however, about preventing further problems. His walking pace and pattern were improved but patient was advised to continue to use the cane for long distances until he was pain free. Non-weight bearing range of motion was reviewed and patient was shown gentle weight bearing activities as lunges and side stepping with no aggravation of symptoms.

On visit number three, patient was pain free when walking on all surfaces with no assistive device. He was educated about low purine diet and instructed in starting a walking program in addition to riding a stationary bike for general fitness. The patient admitted that he had tried to exercise in the past but developed soreness and fatigue. Specific details were provided about gradual progression of activity and monitoring of heart rate and perceived exertion rate.

The patient was seen a year later for a different problem of a low back strain. He had lost 30 pounds and was exercising two to three times a week. He was pleased with his medical management and physical therapy. In addition, he expressed satisfaction that he was more energetic both at work and when playing with his two grandchildren.

### **Discussion**

This patient was partly typical of a patient with gout as he had the risk factors of obesity and hypertension. He did not, however, smoke or drink alcohol and was relatively young for a diagnosis of arthritis. It was learned later that he had a previous incident of joint pain but he did not think it was relevant to mention during the initial interview. He also noted that there was a family history with his father and older sister also having problems with gout, but again, he didn't realize that was related to his problem.

Physical therapists often attribute joint problems to sprains and strains and this patient could have acquired that type of problem with starting a new exercise regime of riding a bike. It was appropriate to prioritize the problems during the first session to addressing the abnormal gait pattern and maintaining range of motion until the pain subsided. Gout may not be a frequent primary reason for referral to physical therapy but pain and abnormal gait are common diagnoses or symptoms. Therapists must be alert to risk

factors and have specific questions and follow up questions in mind during the initial history and evaluation. Most cases are diagnosed by family physicians and seen in the elderly population. (11)

Some patients are managed successfully with non-steroidal anti-inflammatory drugs (NSAIDs) when they have an acute incident of pain. One can take an over the counter medication as ibuprofen or a prescribed NSAID. Others require ongoing low doses of a medication, as allopurinol, to lower the serum level of uric acid or colchicine to prevent or minimize acute bouts of pain and decrease the chance of permanent joint damage. Colchicine can also be used acutely and relieves the attack in 12-24 hours.

Patient education is extremely important for successful management of gout. Patients must adhere to the prescribed dosage and frequency of their medications for successful prevention of pain and activity limitations. One study showed that 75% of newly diagnosed patients quit taking their medication although 50% resumed their medications within a year. (12) Modification of diet alone can decrease 50% of gout cases. It is necessary that patients understand that limited consumption of high purine foods and limited alcohol (specifically beer) play a vital role in reducing pain and debilitating attacks. Reviewing the radiological changes can be a strong incentive to adhere to these dietary changes. (13) Lifestyle changes must also include addressing physical activity. (14) Regular exercise can reduce hypertension, high cholesterol and help reduce weight, all of which are risk factors for gout.

Physical therapy services are not only helpful in addressing a patient's deficit but also in partnering with the patient in wellness and prevention strategies. As practitioners that help prevent "impairments and functional limitations related to movement, function and health" (15), physical therapists can provide detailed information tailored to each patient for an appropriate exercise program. Individualized information is important so that patients are successful in their goal for regular exercise to improve strength, flexibility and endurance. As a team, the therapist and patient evaluate environmental factors and discuss important quality of life issues such as the vocational and avocational desires noted in the case study.

## References:

1. Porth, CM. Essentials of Pathophysiology, Concepts of Altered Health States. Second Edition, Philadelphia: Lippincott Williams & Wilkins 2007; Unit 12: 1038-1039.
2. Centers for Disease Control and Prevention, Last reviewed June 15, 2010. [www.cdc.gov/arthritis/](http://www.cdc.gov/arthritis/) Accessed September 15, 2010
3. Merck manual, Last reviewed February 2008 [www.merck.com/mmpe/sec04/ch035/ch035b.html?qt=gout&alt=sh#sec04-ch035-ch035a-577](http://www.merck.com/mmpe/sec04/ch035/ch035b.html?qt=gout&alt=sh#sec04-ch035-ch035a-577) Accessed September 19, 2010
4. Arthritis Foundation, [www.arthritis.org/disease-center.php?disease\\_id=42](http://www.arthritis.org/disease-center.php?disease_id=42) Accessed September 14, 2010

5. Wallace KI. et al. Increasing prevalence of gout and hyperuricemia over 10 years among older adults in a managed care population. *Journal of Rheumatology* 2004; (8): 1582–1587.
6. Lawrence RC. et al. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part II. *Arthritis Rheumatology* 2008;(1): 26–35.
7. Hochberg MC. et al. Racial difference in the incidence of gout. The role of hypertension. *Arthritis Rheumatology* 1995;(5): 628–632.
8. Arromdee E. et al. Epidemiology of gout: Is the incidence rising? *Journal of Rheumatology* 2002; (11): 2403–2406.
9. Rosemont, IL. United States Bone and Joint Decade: *The Burden of Musculoskeletal Diseases in the United States*. American Academy of Orthopaedic Surgeons; 2008. Chapter 4. Arthritis and Related Conditions.
10. Healthwise, WebMD, Last updated July 2008  
[www.webmd.com/a-to-z-guides/gout-treatment-overview](http://www.webmd.com/a-to-z-guides/gout-treatment-overview) Accessed September 16, 2010
11. Hanly JG. et al. Health Sciences Centre, Halifax, Nova Scotia, and other centers. Gout in the elderly - a population health study. *Journal of Rheumatology*. 2009; 36:822-830.
12. Harrold, L. et al. The Dynamics of Chronic Gout Treatment: Medication Gaps and Return to Therapy. *The American Journal of Medicine*. New York: Jan 2010, Vol 1123, Issue 1, p 54.
13. Simkin P. Sharing decisions in gout: better communication for better outcomes. *Journal of Musculoskeletal Medicine* 2008. Vol. 25 pp 116-121.
14. Mineo I. et al. Practical strategies for lifestyle modification in people with hyperuricemia and gout treatment through diet, physical activity, and reduced alcohol consumption. *Japanese Journal of Clinical Medicine* April 2008, Vol. 66 pp 736-741.
15. American Physical Therapy Association. Vision Statement for 2020. Document updated 12/14/2009.  
[www.apta.org/AM/Template.cfm?Section=Core\\_Documents1&Template=/CM/ContentDisplay.cfm&ContentID=67227](http://www.apta.org/AM/Template.cfm?Section=Core_Documents1&Template=/CM/ContentDisplay.cfm&ContentID=67227) Accessed September 29, 2010