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Original Article

Place of orthopedic surgery in gout

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Abstract

Objective: To evaluate the indications, surgical results, and complications related to tophaceous gout surgery in the orthopedics and traumatology clinic of our hospital.
Methods: A retrospective analysis of all patients who underwent surgery for topical gout in our orthopedics and traumatology clinic between January 2008 and December 2017 was carried out. Their history, physical examination, and radiological and laboratory tests were examined. Surgical indications, surgical results, and complications were analyzed.
Results: Total 18 lesions in 15 patients with gout tophi were operated (60% males). The most common lesion was in the elbow (6; 33%). All patients underwent total excision, and the mean mass size was 4.0 cm. Only one patient had a delayed wound healing. All other patients had no complications.
Conclusion: The results of surgical procedures which were performed to confirm the diagnosis, to reduce mechanical problems due to tophaceous and to alleviate pain were excellent, and complication risk was acceptable. Comorbidities and sepsis were the predictors of surgical complications.
Keywords: Gout, tophi, pain control, hyperuricemia

Introduction

Gout is an inflammatory disease caused by tissue deposits of monosodium urate monohydrate crystals deposits secondary to hyperuricemia (1). The general prevalence of gout is 1%-4% (2).

Recurrent acute arthritis may result in episodes of tuff (especially in the first metatarsophalangeal joint with the auricle), uric acid stones, and gout nephropathy (3). Approximately 12%-35% of the gout patients develop tophi (4).

Lesions with joint localization may cause destruction and deformities, and also tophy may be inflamed or ulcerated. The primary treatment of tophaceous gout is to control the disease by medical treatment (xanthine oxidase inhibitor, allopurinol)(5). However, if there is cosmetic deformation, functional disorder, or sinus drainage, surgical intervention is inevitable (6).

Sometimes, patients who are not diagnosed with gout and who present with a single soft-tissue mass may be diagnosed with excisional biopsy of the mass. Due to the rarity of surgical treatment for gout, surgery is limited to isolated case reports and case series (5, 7).

Methods

A retrospective analysis of all patients who underwent tofaceus gout surgery in our hospital between January 2008 and December 2017 was carried out. Patients with gout who underwent surgery on the gout tophi were included in the study. Gout patients with other surgical procedures were excluded. Demographic data of patients shown in table 1.

All the participants who were legally responsible for first-degree relatives of the patient in the study gave their informed consent prior to research. Written informed consent was obtained from the patient's legal custodian or first-degree relatives for publishing the individual medical records.

The history, physical examination, chest x-ray, magnetic resonance imaging examinations of the affected extremities, and routine laboratory tests of all patients were fully examined. Pathological material was evaluated by an experienced soft-tissue pathologist after the surgery.

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The indications, results, complications, and functional results of the patients were recorded. Data on allopurinol use were obtained by reviewing drug history and drug charts. Delayed wound healing was defined as any wound that could not completely heal in a week of surgery. All the complications of delayed wound healing were recorded up to 6 months postoperatively.

All statistical analyses were performed using the Statistical Package for Social Sciences 22.0 statistical software (IBM Corp.; Armonk, NY, USA). Descriptive statistics are expressed as mean±standard deviation, frequency, and percentage.

Results

Nine male (60%) and six female patients were operated for gout. The mean age at the time of operation was 61.7 (range 18-93).

The most common concomitant disease was hypertension (6 patients, 42%), which is followed by hypothyroidism, Diabetes mellitus (3 patients in each), coronary artery disease, cerebrovascular disease, and vertigo (one patient in each).

In 66% of patients, serum urate levels were high. Eight patients (53%) had a history of known use of colchicine/alluprinol due to known gout.

A total of 18 lesions were operated in 15 patients. The most common lesion site was the elbow (6 lesions, 33%), which is followed by hand (5 lesions), foot (3 lesions), knee (2 lesions), wrist (one lesion around distal ulna) and ankle (one lesion around lateral malleolus); (Figure1, 2).

Main Points

- Surgical indications in gout; mechanical problems due to tofus and control of sepsis in infected/ulcerated tofus.
- Sometimes, patients who are not diagnosed with gout and who present with a single soft-tissue mass may be diagnosed with excisional biopsy of the mass.
- The results of surgical treatments for diagnostic, mechanical problems and pain control indications in gout are very good, and the risk of complications is low.
- To better control of gout disease, the effort at the level of primary care is very important, thus reducing the risk of tophi formation and minimizing the risk of surgery.

Table 1. Demographic data of patients.

	Females n=6	Males, n=9	Toplam, n=15
Avarege age (years)	70.1±24.3	55.5±20.2	61.7±22.4
Age range (years)	25-93	18-79	18-93
Indications for operation			
- mechanical problems	4	4	8
- sepsis control	1	0	1
- Indicating	0	4	4
- pain	2	0	2
Lesion Localisations			
-elbow	1	5	6
-hand	4	1	5
-foot	0	3	3
-Knee	0	2	2
-wrist	1	0	1
-ankle	1	0	1

Figure 1. Direct radiographic findings of gout arthritis with localized elbow, subcutaneously located in the vicinity of the lesion olecranon.

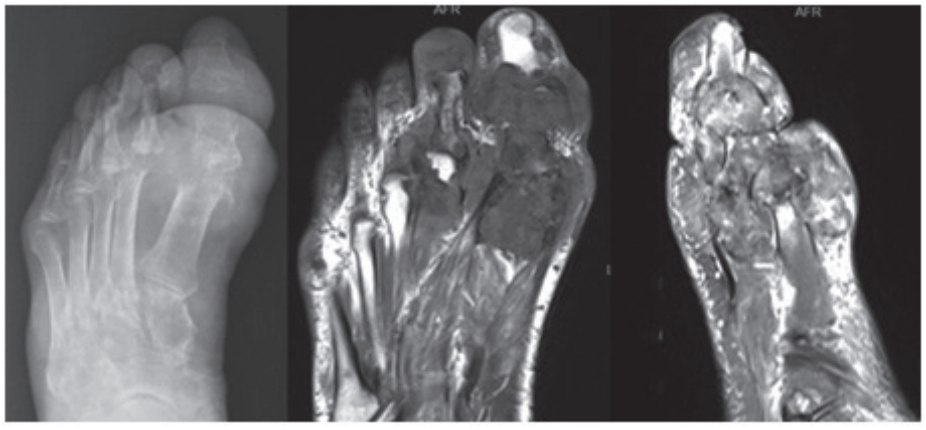

Figure 2. Gout arthritis located of the forefoot. a) X-ray radiograph accompanied by pathologic fracture; b, c) MRI shown large destruction leading to massive destruction.

Figure 3. Ulcerative tophi: (a) white lesion extending outside the skin; b) macroscopic view of the excision material; and (c) multinuclear giant cells with histiocytic cells making pallizading structure around the eosinophilic material consistent with gout tuft, establishing nodular aggregates in wide areas (HEx200). Arrows: histiocytic cells; star: tophi.

Surgical indications were mechanical problems caused by foot, elbow, poplitea, or hand tofus in eight patients, and sepsis control in infected/ulcer tofus in one patient. The diagnosis of the masses of patients before surgery was not evident in four patients. Tofus surgery was performed in two patients for pain control.

All patients underwent total excision in one session (Figure 3). The mean mass size was 4.0 cm (1-14 cm).

None of the patients had any recurrence at the operation site. Only one patient had delayed wound healing (a patient with ulcerative tophi). This patient had no diabetes or any other concomitant disorder. All other patients had no complications. In these patients, wound healing was on average 2 weeks.

The functional outcome was evaluated as the ability to return to the previous functional level, and the examination notes of the 6-month and post-operative follow-up examinations were examined. A fully functional gain was seen in 12 patients. Three patients who did not continue their follow-up could not be identified.

Discussion

Gout is the most common inflammatory arthropathy and disorder of uric acid metabolism (8). The prevalence of gout in advanced Western societies is approximately 0.05% (9). It is known that there has been a significant increase in the frequency of gout in recent years (10). In our country, we could not find any data reflecting the incidence of gout.

Hyperuricemia occurs when the serum uric acid level exceeds7 mg/dL in men and 6 mg/dL in premenopausal women. It is over 6 mg/dL. In 30% of patients with untreated gout, tophi may develop in the first 5 years after the onset of the disease as a result of high serum urate values (11, 12).

A high-protein diet, alcohol consumption, and obesity are some of the common risk factors for that cause high serum uric acid leading to acute attacks of inflammatory arthritis or chronic gouty arthropathy. On the other hand, the low level of uric acid can lead to the formation of tofus and tofus loss (13, 14).

Chronic gouty arthritis with chronic destructive polyarthritis and tophies may develop in patients who are not adequately treated. Tofus often occur in the thumbs, olecranon scholarship, pre-patellar scholarship, ear helix, and achilles tendon (13). Because our cases were representing patients undergoing orthopedic surgery, all lesions were located in the extremities. The most common location was the elbow.

It should be kept in mind in clinical practice that tophies may be located in atypical areas other than classical settlements, and tufts due to delay in treatment may lead to joint destruction in chronic cases (13).

The patients with typical podagra can be diagnosed with gout on clinical examination. Joint aspiration is recommended for the patients who have atypical joint involvement to demonstrate monosodium urate crystals and exclude other causes of acute arthritis. However, gout diagnosis can be made clinically if joint aspiration is not appropriate (15-17).

Dual energy computed tomography (DECT) is a relatively new development in imaging of gout arthritis. DECT is a noninvasive method for the visualization, characterization, and quantification of monosodium urate crystal deposits. As a result, it helps the clinician in early diagnosis, treatment, and monitoring of this condition. Usability and usage have become increasingly widespread in recent years. Unfortunately, DECT was not used in any patient in our study (18).

On the literature review, it was found that studies involving the results of surgical treatment of gout are rare, and the number of cases they contain is small (5, 7). In 2002, Kumar et al. (5) published a series of 45 patients on surgical procedure. They reported a high incidence of complications after surgery due to associated comorbidities. The reasons for the low complication rates in our study: patients had less severe comorbidities, and a higher number of patients underwent surgery for a new diagnosis.These patients did not have the advanced stage of gout.

Lee et al. (19) tophaceous gout reported a series of 17 patients on the surgical procedure. They used a soft-tissue shaving machine similar to the one used for debridement in the arthroscopy procedure and reported excellent results without complications in all patients.

Although gout is one of the most manageable rheumatologic diseases, it is often neglected and poorly controlled, causing complications. Sometimes the skin on tophus ulcers and excretes white, chalky material consisting of monosodium urea crystals. In our case, ulcerated tophus was present, and wound healing was delayed after surgery (Figure 3) (20, 21).

The differential diagnosis of joint involvement in the gout arthritis must include septic arthritis, synovial cyst, nodal osteoarthritis, rheumatoid arthritis, and benign and malignant tu-

mors. Also, tophaceous gout may cause large lytic bone lesions and pathological fractures (8, 16, 17, 20, 21). In our study, we had patients who underwent excisional biopsy because we could not be sure of the diagnosis.

There were some limitations to this study. First it was a retrospective analysis. There are also relatively few cases due to the limited number of surgical indications in gout.

The results of surgical treatments for diagnostic, mechanical problems and pain control indications in gout are very good, and the risk of complications is low. To better control gout, the effort at the level of primary care is very important, thus reducing the risk of tophi formation and minimizing the risk of surgery.

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References

1. Mandell BF. Clinical manifestations of hyperuricemia and gout. Cleve Clin J Med 2008; 75(Suppl 5): 5-8. [CrossRef]
2. Ragab G, Elshahaly M, Bardin T. Gout: An old disease in new perspective - A review. J Adv Res. 2017; 8: 495-511. [CrossRef]
3. Erdem Ö, Goral V, Kara IH. Chronic tophaceus gout nephropathy with hipopotasemia (a case report). Düzce Üniv Tip Fak Derg 2007; 2: 40-5.
4. Kasper IR, Juriga MD, Giurini JM, Shmerling RH. Treatment of Tophaceous Gout: When Medication is not Enough. Semin Arthritis Rheum 2016; 45: 669-74. [CrossRef]
5. Kumar S, Gow P. A survey of indications, results and complications of surgery for tophaceous gout. N Z Med J 2002; 26: 115: U109.
6. Casagrande PA. Surgery of tophaceous gout. Semin Arthritis Rheum 1971; 1: 262-73. [CrossRef]
7. Ertugrul SE, Guzel VB, Takka J. Surgical management of tophaceous gout in the hand. Arch Orthop Trauma Surg 2000; 120: 482-3. [CrossRef]
8. Falidas E, Rallis E, Bournia VK, Mathioulakis S, Pavlakis E, Villias C. Multiarticular chronic tophaceous gout with severe and multiple ulcerations: a case report. J Med Case Rep 2011; 19: 397. [CrossRef]
9. Hazıcı H. Romatizmal Hastalıkların Önemi ve Sıklığı. İç Hastalıkları. İliçin G, Biberoğlu K, Süleymanlar G, Ünal S, editörler. 2. baskı. Güneş Kitabevi; 2003. p. 2689-2691.
10. Bitik B, Öztürk MA. An old disease with new insights: Update on diagnosis and treatment of gout. Eur J Rheumatol 2014; 1: 72-7. [CrossRef]
11. Terkeltaub R. Crystal deposition diseaes. In: Goldman L, Ausiello D, editors. Cecil Medicine. Philadelphia: Saunders Elsevier; 2008. p. 2069-78.
12. Kotake S, Nanke Y. Spinal Tophaceous Gout. Intern Med 2012; 51: 237-8. [CrossRef]
13. Kaya SS, Okçu M. A case of chronic gouty arthritis with unusual localized tophi. Turk J Osteoporos 2018; 24: 26-8. [CrossRef]
14. Beyl RN Jr, Hughes L, Morgan S. Update on Importance of Diet in Gout. Am J Med 2016; 129: 1153-8. [CrossRef]
15. Abhishek A, Roddy E, Doherty M. Gout - a guide for the general and acute physicians. Clin Med 2017; 17: 54-9. [CrossRef]
16. Öztürk R, Arıkan ŞM, Şimşek MA, Ateş ÖF, Toptaş E, Beltir G. A strange case: The dyed finger. SDÜ Tıp Fak Derg 2017: 24: 96-9.
17. Ayas MS, Gül O, Dada ME. Extracranial location of the osteoma: Patella, case report and literature review. Eklem Hastalik Cerrahisi 2018; 29: 189-92.
18. Chou H, Chin TY, Peh WC. Dual-energy CT in gout - A review of current concepts and applications. J Med Radiat Sci 2017; 64: 41-51. [CrossRef]
19. Lee JH, Park JY, Seo JW, Oh DY, Ahn ST, Rhie JW. Surgical treatment of subcutaneous tophaceous gout. J Plast Reconstr Aesthet Surg 2010; 63: 1933-5. [CrossRef]
20. Panahi SP, Kalantar SH, Moslemi S, Tavakkoli M, Carraro M, Mardani V, et al. Multiple Tumor Like Lytic Bone Lesions in a Young Patient with History ofUncontrolled Gout, A Case Report. EC Orthopaedics 2018; 9: 546-50.
21. Öztürk R, Arıkan ŞM, Bulut EK, Kekeç AF, Çelebi F, Güngör BŞ. Distribution and evaluation of bone and soft tissue tumors operated in a tertiary care center. Acta Orthop Traumatol Turc 2019; 53: 189-94. [CrossRef]