

CASE REPORT

Infected nasal gout tophus: A case report

Gill Verstappen  | Olaf Michel | Stijn Halewyck | Vedat Topsakal | Antje Pössneck

Department of Otorhinolaryngology
- Head and Neck Surgery, Universitair
Ziekenhuis Brussel, Vrije Universiteit
Brussel, Brussels, Belgium

Correspondence

Gill Verstappen, Department of
Otorhinolaryngology – Head and Neck
Surgery, UZ Brussel, Laarbeeklaan 101
1090 Jette, Brussels, Health Campus,
Belgium.
Email: gill.verstappen@uzbrussel.be

Abstract

Gout is a common form of inflammatory arthritis, characterized by the deposition of monosodium urate crystals. If chronically present and not adequately treated by serum urate reducers, gout tophi can develop at various locations. Here, we report the first infected gout tophus at the septal cartilage and nasal tip.

KEYWORDS

case report, gout, hyperuricemia, tophus

1 | INTRODUCTION

Gout is a type of inflammatory arthritis in the large scale of rheumatic diseases, characterized by the deposition of monosodium urate (MSU) crystals in peripheral joints, the synovium, or soft tissues in the body that results from excessive levels of serum urate in the blood.^{1,2} Hyperuricemia is defined as a serum urate level greater than 6.8 mg/dl, when plasma becomes supersaturated. With higher serum concentrations, monosodium urate crystallizes, deposits in the tissue, innates host defense mechanisms, and induces inflammation by triggering the production of IL-1 β cytokines.² Several factors contribute to this reaction. A purine-rich diet in combination with alcohol consumption, low temperature, but also lower renal and intestinal excretion rate and genetical determined factors are thought to contribute.^{3–5} Several studies suggest that the prevalence and incidence of gout has risen in recent decades in the wake of rampant lifestyle.⁶ Gout has become a common disorder affecting 1%–3% of the western population.⁷ Most people develop the disease between 30 and 50 years. It presents the most prevalent inflammatory rheumatologic disease.⁸ Diagnosis is made by detecting the typical MSU crystals under a polarized light microscope.⁹ When hyperuricemia is not adequately

treated by serum urate reducers, chronic tophaceous gout may emerge at various locations, mostly in typical but lesser in atypical places in the body. Gout tophi are found mainly at the level of peripheral joints such as the first metatarsophalangeal (MTP) joint. It is rare for a gout tophus to develop at the level of the head and neck area.¹⁰ Here, we describe the case of a patient with multiple gout tophi and a previously unreported infected gout tophus at the septal cartilage and the nasal tip with serum uric acid at a medically controlled normal level.

2 | CASE PRESENTATION

A 62-year-old man presented with complaints of suddenly emerged swelling at the nose tip, redness, and pain. A deformity of the nasal tip had been present for many years, namely, it was widened and thickened, and the patient felt a painless small mass at the level of the right vestibulum, just below the nasal tip. The patient reported no nasal obstruction, rhinorrhea, bleeding, sinusitis, or trauma. The patient was diagnosed with hyperuricemia in 1998 and gout in 2003. Over the previous year, his uric acid level fluctuated between 6.2 and 5.5 mg/dl. He was treated with Febuxostat 60 mg three times a day, which has lowered

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the uric acid level to almost normal in recent years. Nevertheless, he reported a gout attack at the level of the right MTP 1 joint one week earlier. However, he stuck to a purine-rich diet and consumed alcohol. In the past, gout tophi were also diagnosed in several other regions such as the ear lobes, MTP joints, wrists, elbows, shoulders, knees, and ankles. Furthermore, he was known to have arterial hypertension, obesity, and diabetes mellitus type II, all of them known risk factors for gout. There were no important familial antecedents.

The physical examination demonstrated a red, swollen, and painful nose tip, which extended to the right vestibulum and septum. On anterior rhinoscopy, a nodular mass could be visualized just below the nasal tip. The initial clinical diagnosis was furunculosis seen the inflammatory aspect. No puncture was done, not to risk the spread of the infection. The laboratory examination showed no leukocytosis, a uric acid level of 5.6 mg/dl, and a C-reactive protein level of 41.6 mg/L. A head and neck computed tomography scan with contrast showed a mass of 2.5 cm with the destruction of the lamina quadrangularis and extension to the contralateral side (Figure 1). The infection was then treated with Amoxicillin/Clavulanic acid 875/125 mg three times a day for one week and analgesics were started.

Within two weeks, the infectious symptoms had resolved, but the nodular structure just below the nasal tip was still present. Externally, there was a residual deformity of the nasal tip (Figure 2). On physical examination, the nasal tip was still less compliant and widened. To exclude a cyst or tumor, a biopsy was performed, yielding a sandy substance. Anatomopathological examination revealed amorphous material and under a polarized light microscope, MSU crystals could be confirmed. A dual-energy computed tomography (DECT) showed multiple gout

tophi at the level of the septal cartilage, the hands, wrists, elbows, shoulders, knees, ankles, and forefeet (Figure 3).

Since no functional or aesthetic complaints were present, no surgical resection was proposed to the patient. However, the rheumatologist advised further strict uric acid control and rigorous dietary restrictions to bring uric acid level below 5 mg/dl to force resorption of gout tophi. There has been no progression of the nasal mass or external deformity after six-month follow-up.

3 | DISCUSSION

A tophus is a sign of chronic gout presenting as a nodular mass in the subcutaneous tissue, joints, or tendons. It usually develops after more than a decade from the initial presentation of gout due to continuous hyperuricemia.¹⁰ A tophus can also be asymptomatic for extended periods of time, indicating that it is a physical containment that prevents MSU crystal-induced inflammation. Neutrophil extracellular trap formation plays a key role in the formation of a tophus, and they limit inflammation in the tophus by degrading inflammatory cytokines and chemokines.¹⁰ There are three zones in a tophus: a central zone of MSU crystals, which is surrounded by a highly cellular corona zone with inflammatory cells, and a fibrovascular zone as the outer layer.¹¹ There are three typical sites where tophi can develop: the Achilles tendon, the first MTP joint, and the fingers joints. Gout tophi are rarely present in the head and neck area, but they have been described in the auricle, middle ear, the temporomandibular joint, larynx, and subglottic region.^{12–21} Only a few case reports could be found about a nasal gout tophus, mostly at the level of the nasal bridge associated with complaints about aesthetics or nasal obstruction.^{13,21} To the best of our knowledge,

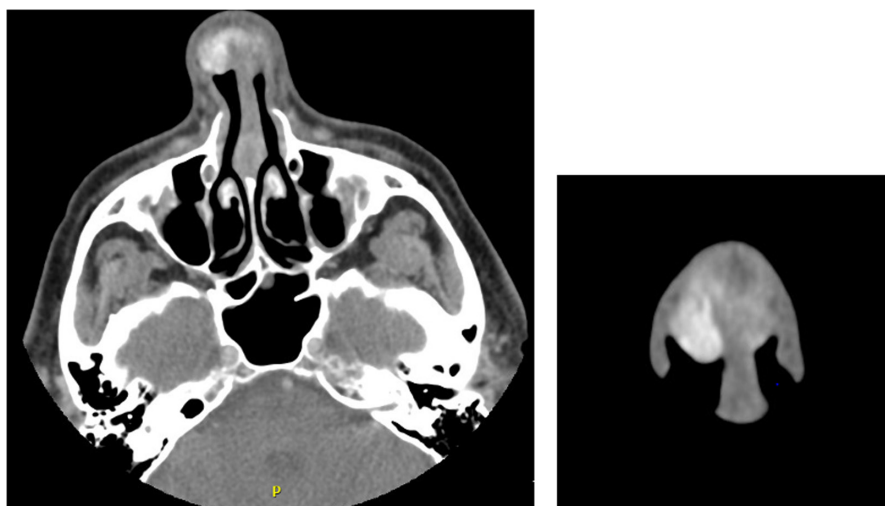


FIGURE 1 Gout tophus at the septal cartilage, just below the nasal tip with cartilage destruction

this is the first case report about an infected tophus at the level of the septal cartilage, just below the nasal tip.

In differential diagnosis, pseudo-gout with calcium pyrophosphate dihydrate crystals and rheumatoid arthritis should be ruled out. Similarly, immune-mediated systemic diseases, such as granulomatosis with polyangiitis, should be considered, because they can also manifest with nasal bridge collapse, paranasal and sinus inflammation, mucosal ulceration, or other otolaryngological manifestations.^{22,23} For higher sensitivity and better specificity, the American College of Rheumatology/European League Against Rheumatism (ACR/EULAR) developed a classification in 2015, adding ultrasound and DECT findings.²⁴ Characteristic in ultrasound is a “double contour” sign in addition to inflammatory aspects such as synovitis, tenosynovitis, and erosions. A DECT allows characterization

of uric acid in contrast to calcium and soft tissues. In addition, X-ray can demonstrate bone or joint destruction.²⁴

Interestingly, gout attacks may occur in spite of normal serum urate levels, with an incidence which ranges between 12% and 63.3%.^{25,26} In the presented case, the patient suffered from gout attacks and had developed multiple tophi despite sufficient urate-lowering therapy with uric acid level about 5.5 mg/dl.

Purine-rich alimentation and neglecting dietary recommendations together with known risk factors, lead to painful gout flares with restriction in professional productivity and economic and social impact, not to mention a decrease in quality of life.^{27–29} The patient was advised, according to the ACR guidelines for the management of gout, to bring the uric acid level below 5 mg/dl to dissolve the MSU crystals. Patients who have a gout flare are strongly advised to use oral colchicine, NSAIDs, or glucocorticoids as first-line therapy over IL-1 inhibitors or adrenocorticotropic hormone. Surgery for tophi is only suggested for ulceration, infection, or unbearable joint pain.^{30,31} In this case, the quality of life can improve after (endoscopic) surgery.³²



FIGURE 2 Deformity of the external nose secondary to the gout tophus

4 | CONCLUSION

A gout tophus in the head and neck area is a rare entity; moreover, an infected gout tophus of the septal cartilage and nasal tip is so far not reported. The diagnosis is based on a biopsy and the evidence of MSU crystals. Additional confirmation is achieved by characteristic ultrasound or DECT findings. The standard treatment is to reduce the uric acid level so that the MSU crystals dissolve. Surgery is suggested only in the case of persistent aesthetic or functional complaints.

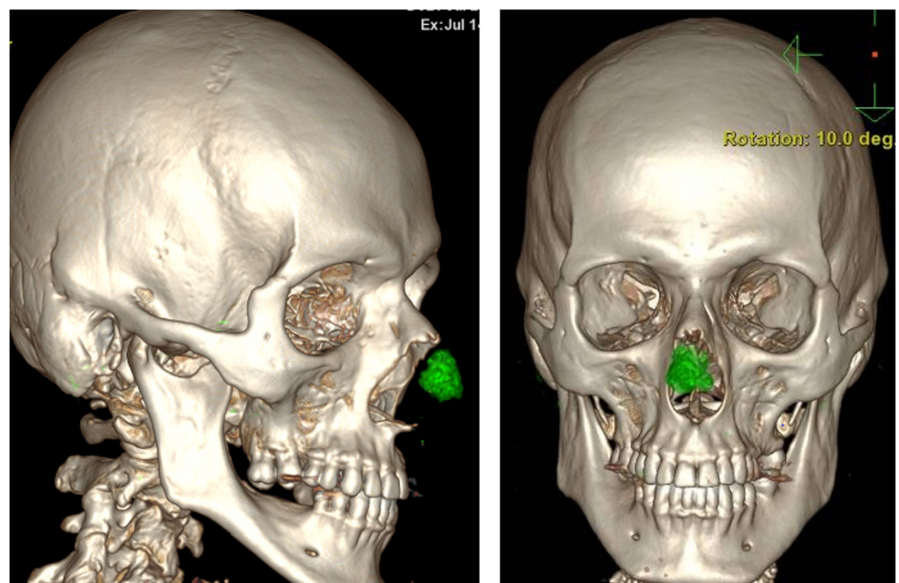


FIGURE 3 Dual-energy computed tomography for detection of monosodium urate deposits (green) in the cartilaginous septum of the nose

AUTHOR CONTRIBUTIONS

Gill Verstappen: Conceptualization; data curation; formal analysis; investigation; methodology; writing – original draft; writing – review and editing. **Olaf Michel:** Supervision; writing – review and editing. **Stijn Halewyck:** Supervision; writing – review and editing. **Vedat Topsakal:** Supervision; writing – review and editing. **Antje Pössneck:** Supervision; writing – review and editing.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

ETHICAL APPROVAL

The Medical Ethics Committee of UZ Brussel/VUB reviewed the documents and decided that there are no objections to the study. BUN: 1432022000197.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

ORCID

Gill Verstappen  <https://orcid.org/0000-0001-6440-7713>

REFERENCES

- Robinson PC, Horsburgh S. Gout: joints and beyond, epidemiology, clinical features, treatment and co-morbidities. *Maturitas*. 2014;78(4):245-251.
- Dalbeth N, Merriman TR, Stamp LK. Gout. *Lancet Lond Engl*. 2016;388(10055):2039-2052.
- Reginato AM, Mount DB, Yang I, Choi HK. The genetics of hyperuricaemia and gout. *Nat Rev Rheumatol*. 2012;8(10):610-621.
- Zhang Y, Chen C, Choi H, et al. Purine-rich foods intake and recurrent gout attacks. *Ann Rheum Dis*. 2012;71(9):1448-1453.
- Zou F, Zhao X, Wang F. A review on the fruit components affecting uric acid level and their underlying mechanisms. *J Food Biochem*. 2021;45(10):e13911.
- Roddy E, Choi HK. Epidemiology of gout. *Rheum Dis Clin North Am*. 2014;40(2):155-175.
- Wijnands JMA, Viechtbauer W, Thevissen K, et al. Determinants of the prevalence of gout in the general population: a systematic review and meta-regression. *Eur J Epidemiol*. 2015;30(1):19-33.
- Monu JUV, Pope TL. Gout: a clinical and radiologic review. *Radiol Clin North Am*. 2004;42(1):169-184.
- Phelps P, Steele AD, McCarty DJ. Compensated polarized light microscopy. Identification of crystals in synovial fluids from gout and pseudogout. *JAMA*. 1968;203(7):508-512.
- Chhana A, Dalbeth N. The gouty tophus: a review. *Curr Rheumatol Rep*. 2015;17(3):19.
- Palmer DG, Hogg N, Denholm I, Allen CA, Highton J, Hessian PA. Comparison of phenotype expression by mononuclear phagocytes within subcutaneous gouty tophi and rheumatoid nodules. *Rheumatol Int*. 1987;7(5):187-193.
- Song Y, Kang ZW, Liu Y. Multiple gouty tophi in the head and neck with normal serum uric acid: a case report and review of literatures. *World J Clin Cases*. 2022;10(4):1373-1380.
- Wu JCH, Chou PY, Chen CH. Nasal gouty tophus: report a rare case presenting as a nasal hump with nasal obstruction. *Biom J*. 2016;39(4):295-297.
- Oliveira IN, Gomes RC, dos Santos RR, Oliveira TDP, Pereira LL, Mainenti P. Gout of the temporomandibular joint: report of a case. *Int Arch Otorhinolaryngol*. 2014;18(3):316-318.
- Saliba J, Sakano H, Friedman RA, Harris JP. Tophaceous gout of the middle ear: case reports and review of the literature. *Audiol Neurootol*. 2019;24(2):51-55.
- Faas I. A gouty tophus in the temporomandibular joint and on the eustachian tube. *Laryngol Rhinol Otol (Stuttg)*. 1983;62(12):574-577.
- Tsikoudas A, Coatesworth AP, Martin-Hirsch DP. Laryngeal gout. *J Laryngol Otol*. 2002;116(2):140-142.
- Marion RB, Alperin JE, Maloney WH. Gouty tophus of the true vocal cord. *Arch Otolaryngol Chic Ill 1960*. 1972;96(2):161-162.
- Habermann W, Kiesler K, Eherer A, Beham A, Friedrich G. Laryngeal manifestation of gout: a case report of a subglottic gout tophus. *Auris Nasus Larynx*. 2001;28(3):265-267.
- Sutton L, Parekh P. Perforating gout of the ear. *Dermatol Online J*. 2016;22(10):13030/qt1vn208xw.
- Chen SL, Chen JR, Yang SW. Painless gouty tophus in the nasal bridge: a case report and literature review. *Medicine (Baltimore)*. 2019;98(11):e14850.
- Garefis K, Marini K, Skliris JP, et al. Granulomatosis with polyangiitis: otorhinolaryngological manifestations and meningeal involvement. *Ear Nose Throat J*. 2022;15:1455613221078180.
- Greco A, Marinelli C, Fusconi M, et al. Clinic manifestations in granulomatosis with polyangiitis. *Int J Immunopathol Pharmacol*. 2016;29(2):151-159.
- Neogi T, Jansen TLTA, Dalbeth N, et al. 2015 gout classification criteria: an American College of Rheumatology/European league against rheumatism collaborative initiative. *Arthritis Rheumatol Hoboken NJ*. 2015;67(10):2557-2568.
- Lee JS, Kwon OC, Oh JS, et al. Clinical features and recurrent attack in gout patients according to serum urate levels during an acute attack. *Korean J Intern Med*. 2020;35(1):240-248.
- Urano W, Yamanaka H, Tsutani H, et al. The inflammatory process in the mechanism of decreased serum uric acid concentrations during acute gouty arthritis. *J Rheumatol*. 2002;29(9):1950-1953.
- Scheepers LEJM, van Onna M, Stehouwer CDA, Singh JA, Arts ICW, Boonen A. Medication adherence among patients with gout: a systematic review and meta-analysis. *Semin Arthritis Rheum*. 2018;47(5):689-702.
- Edwards NL, Sundry JS, Forsythe A, Blume S, Pan F, Becker MA. Work productivity loss due to flares in patients with

- chronic gout refractory to conventional therapy. *J Med Econ.* 2011;14(1):10-15.
29. Brook RA, Forsythe A, Smeeding JE, Lawrence Edwards N. Chronic gout: epidemiology, disease progression, treatment and disease burden. *Curr Med Res Opin.* 2010;26(12):2813-2821.
 30. Khanna D, Khanna PP, Fitzgerald JD, et al. 2012 American College of Rheumatology guidelines for management of gout. Part 2: therapy and antiinflammatory prophylaxis of acute gouty arthritis. *Arthritis Care Res.* 2012;64(10):1447-1461.
 31. FitzGerald JD, Dalbeth N, Mikuls T, et al. 2020 American College of Rheumatology guideline for the management of gout. *Arthritis Care Res.* 2020;72(6):744-760.
 32. Chow VJ, Tsetsos N, Poutoglidis A, Georgalas C. Quality of life in sinonasal tumors: an up-to-date review. *Curr Opin Otolaryngol Head Neck Surg.* 2022;30(1):46-57.

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