



A survey of indications, results and complications of surgery for tophaceous gout

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Abstract

Aims To document the indications, results and complications associated with surgery for tophaceous gout in Middlemore Hospital.

Methods A retrospective study of the notes of all patients who underwent surgery for tophaceous gout at Middlemore Hospital from July 1995 to July 2001 was performed. Serum creatinine and uric acid results were obtained and the use of allopurinol assessed.

Results 45 patients underwent surgery for gouty tophi. 89% were males and 11% females. 16% were Maori, 38% Pacific people, 42% Europeans and 4% were from other ethnic backgrounds. Renal impairment (serum creatinine. >0.11mmol/L) was the most common associated medical problem (38%), followed by hypertension (27%), ischaemic heart disease and/or congestive heart disease (20%) and diabetes mellitus (18%). 68% of patients had elevated serum urate levels (>0.42mmol/L) and only 31% had previously been taking allopurinol. Sepsis control in infected or ulcerated tophi was the main indication for surgery (51%), followed by mechanical problems caused by foot, elbow and hand tophi (27%). The diagnosis of soft tissue masses was unclear in 18% of the patients prior to surgery. 4% of patients underwent tophus surgery mainly for pain control. 53% of patients experienced delayed wound healing as a result of complications of surgery with the majority of these patients (16/24, 67%) having infected or ulcerated tophi prior to surgery. Three patients (7%) required digital amputations for ongoing sepsis. 47% of patients did not have any complication of surgery and had complete wound healing within one week.

Conclusions Surgery for tophaceous gout is associated with a relatively high rate of complication when sepsis is the main indication. Patients with gout in this study population had several associated medical co-morbidities, which contributed to the high complication rate. Gout control was poor as evidenced by a high rate of hyperuricaemia, and less than one third of the study population were on allopurinol. Better control of gout would reduce the risk of tophi formation and the need for surgery.

Gout due to deposition of monosodium urate crystals in and around the joints is a common metabolic condition among the Polynesian population of New Zealand. The prevalence of gout in Maori is 6.4% and in Europeans is 2.9%.¹ Among Maori men prevalence of gout is 13.9% and European males 5.8%. Hyperuricemia is significantly more common in Maori men (27.1%) than European men (9.4%).¹

Gouty tophi are one of the manifestations of prolonged, uncontrolled hyperuricaemia and result from deposition of urate crystals in soft tissues, tendon sheaths, bony prominences and joints.² This causes joint destruction and deformities. Tophi can become inflamed, ulcerated and infected, or cause pressure effects. The mainstay of management of tophaceous gout remains medical therapy with the xanthine oxidase

inhibitor, allopurinol.^{3,4} It requires years of stringent control of hyperuricemia before the tophi eventually disappear. Surgery remains an uncommon but important therapeutic option for pain or pressure effects, including entrapment neuropathy.^{5,6} Because of complications it is rarely performed, with literature reviews limited to isolated case reports.⁷⁻⁹

Methods

This survey was undertaken to look at the indications, results, and complications associated with surgery for tophaceous gout. A retrospective analysis of all patients who underwent surgery for tophaceous gout at Middlemore Hospital from July 1995 to July 2001 was undertaken. Patients with gout who had surgery related to gouty tophi were included in the study. Gout patients who had other surgical procedures were excluded.

Details of associated medical conditions, indications for surgery, results, complications and functional outcomes were recorded. Serum creatinine and urate results were obtained from computerised laboratory records. Data on allopurinol use was obtained from medication history and by reviewing drug charts. Delayed wound healing was defined as any wound that failed to heal completely within one week of surgery. All complications leading to delayed wound healing were recorded up to six months following surgery.

Results

45 patients underwent surgery for tophaceous gout, 60% of whom were referred by general practitioners, 22% emergency department physicians and 18% by rheumatologists. The majority of patients were males (89%), within the age range 41-60 years (66%) and of Maori or Pacific race (54%).

Renal impairment (serum creatinine >0.11mmol/L) was the most common associated medical condition (38%), followed by hypertension (27%), ischaemic heart disease and/or congestive heart failure (20%), diabetes mellitus (18%) and obesity (11%). Several patients had more than one medical condition. Hyperuricaemia (urate >0.42mmol/L) was present in 68% of patients but 12% did not have urate levels checked. Only 31% of patients were receiving allopurinol prior to surgery. Indications for surgery were classified into four main groups: sepsis control (infected/ulcerated tophi), mechanical problems, diagnostic procedure and pain control (Table 1).

Table 1. Indications and results of surgery.

Indication			Results			
			Wound healed in one week		Delayed wound healing	
			Number	%	Number	%
Sepsis control (infected/ulcerated tophi)	23	51	7	30	16	70
Mechanical problems (foot)	8	18	4	50	4	50
Mechanical problems (elbows and hands)	4	9	3	75	1	25
Diagnostic difficulty (tophi vs tumor vs sepsis)	8	18	6	75	2	25
Pain control	2	4	1	50	1	50
TOTAL	45	100	21	47	24	53

Delayed wound healing occurred in 53% of patients. The wound healed within one week in 47%. The outcome was worse in patients who had pre-existing sepsis (16/23,

70%) compared with patients who had 'clean' surgery (8/22, 36%). Delayed wound healing was more common with foot surgery (50%) than to upper limb surgery (25%). The main complications leading to delayed wound healing were slow healing without sepsis (33%), ongoing sepsis requiring antibiotics and/or dressings (21%), a discharging sinus (17%), ongoing sepsis requiring amputation (13%), failure of skin graft (8%), wound haematoma (4%) and delayed union of bones at the osteotomy site (4%).

Functional outcome was measured as the ability to return to the previous level of functioning and this was assessed at six months after operation in 35 patients (78%). Two patients had died and eight patients could not be located. Three out of 35 (9%) patients were left with minor disabilities as a result of digit amputations. One patient developed complex regional pain syndrome type 1 involving an arm and required pain management with reasonable outcome. One patient had ongoing pain at the osteotomy site requiring regular non-opiate analgesia. The other 30 patients had returned to their previous level of functioning.

Discussion

Gout is the most common rheumatological condition in South Auckland, which has a large Maori and Pacific Island population. The prevalence of tophaceous gout in New Zealand is unknown, but it is commonly seen in clinical practice. The mainstay of treatment for tophaceous gout is to lower the uric acid level with dietary and medical therapy, but this may not be easy to achieve as several patients in South Auckland present with severe disease, have several co-morbidities and have difficulties with drug compliance. Our study confirms that surgery for tophaceous gout is associated with a high complication rate and should be reserved for special indications only. Lower extremity surgery had a worse outcome compared to that in the upper extremity, which in some instances was due to previously unrecognised peripheral vascular disease.

This study appears to include the largest number of patients reported to have undergone surgical treatment for tophaceous gout. A literature search using Medline and Cochrane Library databases from 1960 have failed to reveal similar studies. Several case reports have been published showing beneficial results for specific indications,⁵⁻⁹ but none was large enough to compare with our study, the size of which reflects the prevalence of gout in the South Auckland population.

Management of gout remains a challenge in South Auckland for reasons discussed earlier, but there also appears to be a lack of uniformity among medical staff about when to start urate lowering agents, which may explain why less than one third of our study patients were on allopurinol. Recommendations we propose to improve care of gout patients include:

- Education of medical practitioners with the assistance of agreed guidelines to ensure uniformity of management of gout and minimise confusion among other healthcare professionals, and patients.
- Early introduction of urate lowering agents in patients who present with more than one episode of gout or with tophaceous gout.
- Referral to the rheumatology service of any patient who has gout and comes to hospital for a surgical procedure so that preoperative treatment can be optimised and post-operative follow-up organised to reduce surgical complications.

- Education of patients with gout in primary care by general practitioners, practice nurses and community workers.

In conclusion, this study demonstrated that surgery for tophaceous gout is associated with a relatively high rate of complications, especially when sepsis is the main indication. Patients in this study population had several associated co-morbidities which would likely have contributed towards the high complication rate. Gout control was poor as evidenced by the high rate of hyperuricaemia and inadequate use of allopurinol at the time of surgery. More effort is required at primary care level to obtain better control of gout so that the risk of tophus formation is reduced and the need for surgery minimised.

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