

Clinical misdiagnosis of Morton's neuroma: a case of early rheumatoid arthritis

Caroline Robinson MSc FCPodS, Senior Lecturer & Specialist in Podiatric Surgery,*
Simon J Otter MSc SRCh, Senior Lecturer* & Catherine J Bowen MSc SRCh, Lecturer†

*School of Health Professions, University of Brighton

†School of Health Professions & Rehabilitation Science, University of Southampton

ABSTRACT

A fit and apparently healthy male patient presents with symptoms and clinical signs consistent with a Morton's neuroma. Following excisional surgery, histopathology confirms the lesion as a rheumatoid nodule; this proves to be the presenting feature of rheumatoid arthritis in this patient.

This is a very unusual differential diagnosis, which should be considered during the assessment process and is, therefore, highly pertinent to clinicians.

CASE REPORT

A 56-year-old Caucasian male presented with moderate-to-severe bilateral forefoot pain that had been present for the past two years. The past medical history was unremarkable except for diffuse musculoskeletal pain in the cervical spine region for which the non-steroidal anti-inflammatory drug meloxicam (500mg bd) was prescribed.

Clinically, both on visual examination and palpation, there was a marked soft-tissue swelling affecting the left fourth metatarsal interspace. The swelling was particularly noticeable on weight bearing and caused the fourth and fifth toes to splay. Palpation of the swelling produced discomfort, and direct retrograde pressure applied from a plantar direction, just distal to the interspace, elicited sharp pain.

The history was one of pain developing during walking and becoming progressively worse with more activity. This pain was localised to the area of swelling and was also reported as radiating distally into the fourth and fifth toes. The size of the swelling and associated pain had increased gradually over the past two years, although the patient described both features as fluctuating. Examination of the right foot revealed similar clinical features at the same site, but these were much less obvious and of less concern to the patient. The history and clinical findings strongly suggested that the diagnosis was an intermetatarsal neuroma with associated bursa formation.^{1,2}

MANAGEMENT

Previous treatment with foot orthoses utilising both valgus fillers and metatarsal pads to redistribute pressure had failed to provide relief. Considering the clinical history and symptomology a diagnosis of Morton's neuroma was made. The patient was not keen to undergo local injection of glucocorticosteroid to the neuroma and elected to undergo neurectomy under local anaesthesia.

Pre-operative blood tests were unremarkable and excision of the suspected neuroma was undertaken as a day case under ankle-

block anaesthesia, via a dorsal incision to the fourth metatarsal interspace. Recovery was uneventful. The soft tissue mass excised measured 3cm by 1cm, with a central cyst-like cavity containing a yellow-coloured viscous fluid with outer lobular fatty tissue. The macroscopic appearance of the lesion was not consistent with that of a neuroma and the specimen was sent for histological examination. The histopathology report revealed '*...the latter changes are reminiscent of rheumatoid nodule formation*'. This finding was rather surprising, as at the time of surgery the only noteworthy reported medical history was chronic musculoskeletal pain in the region of the cervical spine.

During the post-operative period the patient rapidly developed many symptoms classically associated with Rheumatoid arthritis (RA).³ These included continued neck and shoulder pain, weakness affecting his arms and hands (worse on the right side), swelling of the right hand and wrist area, and a soft, nodular swelling overlying the left elbow. Haematological analysis (outlined in Table 1) suggested a gross inflammatory state. Subsequent referral to a local consultant rheumatologist was arranged.

DISCUSSION

Clinical examination of both feet suggested that the soft tissue swelling in the fourth inter-metatarsal space was most likely to be a neuroma, with associated bursa formation. Morton's neuroma (synonymously referred to as Morton's metatarsalgia, Morton's neuralgia or plantar digital neuritis) was named after Thomas G Morton, who described this pathology affecting the 4th inter-metatarsal space.⁵

Classically this pathology is described as a fusiform swelling of the third and fourth plantar digital nerves.⁶ However, there remains debate as to which intermetatarsal space is most commonly affected, with some authors concluding that Morton's neuroma does not occur in the 4th-5th metatarsal space.⁷ Histologically endoneural oedema, exceptional fibrosis and demyelination are said to be diagnostic characteristics of an intermetatarsal neuroma.⁸

Histopathology in this case reported findings reminiscent of a rheumatoid nodule. Excluding anaemia and constitutional symptoms, rheumatoid nodules are the most common extra-articular

Correspondence to:

Caroline Robinson, Leaf Hospital, St Annes Rd, Eastbourne BN21 2HN.

Results of Haematological Analysis	Normal values ⁴
ESR 67mm/hour	1–3mm/hour
CRP 80µg/ml	<0.8mg/dL
WBC 13.5 × 10 ⁹ /L	4.0 – 10.0 × 10 ⁹ /L
Neutrophil 9.2 × 10 ⁹ /L	2.5 – 7.5 × 10 ⁹ /L

Table 1. Haematological analysis.

manifestations of RA.⁹ Nodules usually develop with an insidious onset over areas of pressure or in tendons or tendon sheaths.¹⁰ Although not usually painful, nodules can become symptomatic if subjected to pressure and stress.¹¹

In patients with RA, the general incidence of subcutaneous nodules is 20–40%,¹¹ and rheumatoid nodules are reported to be relatively common in the foot.¹² Rheumatoid nodules may increase or decrease in size, resolve, reappear or persist indefinitely. With repeated trauma rheumatoid nodules may ulcerate and form a portal for infection.^{11,12} The treatment of a symptomatic subcutaneous nodule, therefore, is usually excision, though recurrence is a possibility.¹⁰

Rheumatoid nodules are said to form the hallmark of seropositive rheumatoid disease.¹³ They do form part of the diagnostic criteria for RA,¹⁴ and, as such, nodules constitute a useful diagnostic or prognostic disease marker. However, it is more usual for extra-articular pathologies such as nodules to develop much later in the course of the disease and only rarely are they the first presenting feature.¹⁵ Their usefulness as disease markers is thus limited.¹⁶ It is more commonly reported in RA that inflammation affecting the inter-metatarsal bursa is sufficient to cause stretching or compression of the inter-digital nerves, producing symptoms similar to those of Morton's neuroma.^{17,18}

The more usual differential diagnoses for Morton's neuroma include a range of conditions including synovitis, bursitis and Freiberg's disease, as well as neurological causes. However, consideration of rheumatoid nodules as a differential diagnosis does not receive wide attention in the contemporary podiatric literature.^{19,20} Recently Emery *et al*²¹ have developed guidelines for the referral of patients in the event of clinical suspicion of RA. The atypical presentation in this case did not lead to the suspicion that the patient may have RA.

The diagnosis of Morton's neuroma is generally made through history and clinical examination.^{20,22} More recently ultrasonography has been employed to aid the diagnosis of neuromas. Recent reports^{22,23} have indicated sensitivity for the diagnosis of neuromas using ultrasonography of 94–100% and a specificity of 80–100%, although the authors²³ point out that there is little consistency in the methodologies employed.

In retrospect, the use of ultrasound imaging in this case would almost certainly have confirmed the presence of a soft tissue mass, although whether a clear differentiation (using this investigative method) between a rheumatoid nodule or Morton's neuroma can be accurately identified is more difficult to determine. Whilst there are guidelines for ultrasound imaging in rheumatology,²⁴ there remains a paucity of literature outlining the nature and/or prevalence of foot pathologies in early RA.

X-ray remains an important part of the diagnostic criteria for patients with RA.¹⁴ It has been repeatedly reported that patients with RA demonstrate periarticular erosions in the feet earlier than in the hand.^{25–27} However, all patients in these data series already have a positive diagnosis of RA.

In this case the clinical signs and symptoms were strongly suggestive of Morton's neuroma. In the absence of other features suggestive of early RA, reported by Emery *et al*,²¹ it was felt that plain

film radiography was not appropriate. In cases where there are inconclusive clinical findings, ultrasound or magnetic resonance imaging of suspected neuromas might be considered to help confirm the diagnosis.

CONCLUSION

This case was noteworthy, as the first presentation of RA was a subcutaneous nodule in the foot. Symptoms arising from the nodule mimicked those of an inter-metatarsal neuroma and in the absence of other clinical features was incorrectly diagnosed as this lesion. Imaging modalities such as ultrasonography could be considered as a useful aid to diagnosis.

Pain and inflammation of the small joints in the hands and feet more commonly typify early RA. The case also highlights the importance of recognising the early manifestations of systemic inflammatory arthropathies that may present within the foot.

ACKNOWLEDGEMENTS

The authors wish to thank Dr J Mercer, Consultant Histopathologist, Eastbourne District General Hospital, for assisting with the diagnosis and Mr A McCulloch and Dr K Springett for reviewing the manuscript.

REFERENCES

- Brantingham JW, Snyder R, Michaud T, Morton's neuralgia. *J Manip Physiol Ther* 1991; **5**: 238–243
- Nicolopoulos CS, Scott BW, Giannoudis PV, Biomechanical basis of foot orthotic prescription. *Current Orthopaedics* 2000; **14**: 464–469.
- Klippel JH, Dieppe PA, Ferri FF, Primary care. *Rheumatology*. London: Mosby 1999: 143–154.
- Entwistle IR, *Exacta Medica*. New York: Churchill Livingstone 1989: 8–16.
- Morton TG, A peculiar and painful affection of the fourth metatarsophalangeal articulation *Am J Med Sc* 1876; **71**: 37–39.
- Rendall GC, Thompson CE, Boyd PM, Disorders of the adult foot. In: Lorimer DL, French G, West S (Eds), *Neale's Common Foot Disorders*, 5th Edn. Edinburgh: Churchill Livingstone 1997: 65–118.
- Klenerman L, Morton's neuroma. *Clinical Orthopaedics* 1997; **11**: 15–18.
- Miller SJ Intermetatarsal neuromas and associated nerve problems' In: Butterworth R, Dockery GL, (Eds), *A Colour Atlas and Text of Forefoot Surgery*. London: Wolfe 1992: 159–182.
- Older SA, The extra-articular manifestations of rheumatoid arthritis. In: Fischbach M (Ed), *Rheumatoid Arthritis – Contemporary Management of Internal Medicine* 1991; **1**(6): 41–98.
- Jones RO, Chen JB, Pitcher D *et al*, Rheumatoid nodules affecting both heels with surgical debulking. *J Am Pod Med Assoc* 1996; **86**(4): 179–182.
- Ferrari R, Cash J, Maddison P, *Rheumatology Guide Book*. BIOS Scientific Publishers 1996: 117–124.
- Cawley MID, Vasculitis and ulceration in rheumatic diseases of the foot. In: Jayson MIV, Smidt LA (Eds), *The Foot in Arthritis Baillere's Clinical Rheumatology* 1987 **1**(2): 35–333.
- Sobel E, Caselli MA, McHale KA, Pedal Manifestations of musculoskeletal disease. *Clinics in Podiatric Medicine and Surgery* 1998; **15**(4): 435–479.
- Arnett FC, Edworth S M, Bloch D A, The American Rheumatism Association 1987 revised criteria for the classification of rheumatoid arthritis. *Arthritis & Rheumatism* 1988; **31**: 315–324.
- Wollheim FA, Rheumatoid arthritis – the clinical picture. In: Maddison PJ, Isenberg DA, Woo P, Glass DN (Eds), *Oxford Textbook of Rheumatology*. Oxford University Press 1993; **2**: 639–661.
- Young A, Short term outcomes in recent onset rheumatoid arthritis. *British Journal of Rheumatology* 1995; **34**(Suppl 2): 79–86.
- Anderson EG, The rheumatoid foot: a sideways look. *Annals of the Rheumatic Diseases* 1990; **49**: 851–857.
- Goldie I, The rheumatoid foot. *Current Orthopaedics* 1996; **10**: 110–114.
- Merriman LM, Tollafield DR, *Assessment of the Lower Limb*. Edinburgh: Churchill Livingstone 1995: 383–384.

20. Lorimer DL, French G, O'Donnell M, Burrow JG, Neale's *Disorders of the Foot*, 6th Edn. Edinburgh: Churchill Livingstone 2002: 158-166.
21. Emery P, Breedveld FC, Dougados M, *et al*, Early referral recommendation for newly diagnosed rheumatoid arthritis: evidence based development of a clinical guide. *Annals of Rheumatic Disease* 2002 **61**: 290-297.
22. Jones S, Bygrave CJ, Betts RP, Smith TWD, Morton's neuroma: a sonographic-surgical evaluation. *The Foot* 1999; **9**: 189-192.
23. Irwin LR, Konstantoulakis CK, Hyder NU, Sapherson DA, Ultrasound in the diagnosis of Morton's neuroma. *The Foot* 2000; **10**: 186-189.
24. Backhaus M, Burmester G-R, Gerber T, *et al*, Guidelines for musculoskeletal ultrasound in rheumatology. *Annals of Rheumatic Disease* 2001; **60**: 641-649.
25. van der Heijde DMFM, van Leeuwen MA, van Riel PLCM, Biannual radiographic assessments of hands and feet in a three year prospective follow-up of patients with early rheumatoid arthritis *Arth & Rheum* 1992; **35**(1): 26-33.
26. van der Heijde, A. Remme CA. Hofman DM. Jacobs JWJ, Bijlsma JWJ, Prediction of progression of radiologic damage in newly diagnosed rheumatoid arthritis *Arth & Rheum* 1995; **38**(10): 466-474.
27. Hulsmans HMJ Jacobs JWJ van der Heijde, DMFM, *et al*, The course of radiologic damage during the first six years of rheumatoid arthritis *Arth & Rheum* 2000 **43**(9): 1927-1940.