

The outcomes of surgery for rheumatoid nodules in the hand

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ABSTRACT

Rheumatoid nodules are common extra-articular manifestations of rheumatoid arthritis (RA). It is estimated that 35–40% of patients diagnosed with RA have got nodules localised in various body regions. Rheumatoid nodules constitute a fairly common problem in the hand surgeon's practice.

This study presents the results of operative treatment of 30 patients with rheumatoid nodules in the upper limb – 21 women and 9 men with a mean age of 51 years. Only 6 of the 30 patients (20%) had RA diagnosed prior to surgery. All but 1 nodules were

localised on the hands. The follow-up assessment was performed in a form of a phone interview on average 1.5 years following the surgery. All patients declared satisfaction with the results of the treatment, 5 (17%) had a slight pain in the postoperative scar, and 6 (20%) complained about the esthetic effect. Two cases (7%) of recurrence at the operation site were noted. The results of this study indicate a good effect of surgery and justify this approach to rheumatoid nodules in hands.

Keywords: rheumatoid arthritis; rheumatoid nodules; operative treatment; surgery outcomes.

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic, inflammatory disease related to immune function and characterized by destructive, disabling polyarthritis. It is increasingly evident that RA does not only affect the joint but can often present with extra-articular and systemic complications. A rheumatoid nodule is the most common extra-articular manifestation and characteristic lesion in RA patients. It is estimated that 35–40% of patients diagnosed with RA have got nodules localised in various body regions. The occurrence of rheumatoid nodules is not essentially related to the severity and duration of the basic disease. Nevertheless, they tend to occur more frequently in patients with a longer-lasting disease [1, 2]. Interestingly, the lesions can arise also in persons with no history of RA and their rheumatoid character is diagnosed only after histological examination [2].

Clinical picture and diagnostics

Rheumatoid nodules present in the upper limb in the hand, forearm, and at the elbow, usually periarticular, and more frequently at the dorsal side of the hand/finger (Fig. 1, 2). They tend to occur in sites exposed to repeated minor traumas and compression. The lesions are localized deeply in the true skin or at the border between skin and subcutaneous tissue.

Except for dermal manifestation, they can arise in various non-cutaneous sites such as the lung, pleura, tendon, pericardium, peritoneum, and the liver [3]. Rheumatoid nodules are essentially asymptomatic, but in the periarticular localization they may cause limitation of finger movement, especially when they are numerous (Fig. 1). The diagnosis of rheumatoid nodules is usually based on typical clinical characteristics, without requiring additional diagnostic testing.

Differential diagnosis

Clinical presentation of single rheumatoid nodules in patients with no history of RA is similar to giant-cell tumours of the tendon sheath, although their typical localization is different (Fig. 1, 2). Big tumours presented at the elbow should be differentiated from gouty nodules (Fig. 3).



FIGURE 1. Numerous rheumatoid nodules in a patient diagnosed with rheumatoid arthritis



FIGURE 2. Rheumatoid nodule in the thumb



FIGURE 3. Rheumatoid nodule at the elbow

There is scarce literature about the results of the treatment of rheumatoid nodules, and no reports published in the Polish journals. This prompted the author to prepare this article. The objective of this study was to assess the outcomes of surgery for rheumatoid nodules localized in the hand.

MATERIALS AND METHODS

Over a period of 4 years (2015–2018), 30 patients, 21 (70%) women and 9 (30%) men, aged on average 51 years (range 43–64), with tumours localised in the upper limbs which appeared to be rheumatoid nodules in histological examination, were operated on at the authors' institution. It constituted 8.7% of the total number of benign tumours treated in that period. Only 6 of 30 (20%) patients had RA diagnosed before surgery, whereas in the remaining persons the lesions were not suspected of this character. Twenty-three (77%) patients had single nodules, while 7 (23%) had several lesions present in both hands, thus a total number of the nodules amounted to 41. All but 1 of the lesions were localised on the hands: 31 in the fingers, 9 in the metacarpus, 24 on the dorsal side, 13 on the palmar side, and 3 on the lateral side of the fingers. In 1 patient the tumour involved dorsal side of the elbow (Fig. 3). Duration of the disease (time between detection of the nodule and operation) was a mean of 3 years (range 3–5). In most cases, the tumours were asymptomatic and did not affect hand function. The justification to undergo surgery was fear of cancer and aesthetic considerations. Size of the nodules measured prior to operation was 7 mm on average (range 4–22 mm).

All patients were operated on. Single lesions were excised under local anaesthesia, and multiple lesions under brachial plexus block and in the bloodless field (with a tourniquet). All resected tumours were given histological examination, which confirmed the diagnosis of a rheumatoid nodule. The follow-up assessment was performed in a form of a phone interview in all patients, at a mean of 1.5 years (range 8 months–3 years) following surgery. The patients were asked about recurrence, the appearance of new nodules, possible complaints at the operation site, and the esthetic effect.

RESULTS

Most of the tumours were resected *in toto*, with a slight margin of healthy tissue. Some of the nodules had a well-defined capsule and these were encapsulated. Two patients with multiple nodules (Fig. 1) were operated on several times over a period of 1.5 year. Three (10%) complications were noted in the post-operative period: 2 wound infections (which were successfully treated with antibiotics) and 1 case of wound dehiscence.

In the follow-up assessment (1.5 years on average), all patients declared satisfaction with the results of the treatment. Five (17%) persons had a slight pain at the postoperative scar and none reported a reduction in the function of the hand. Six (20%) patients were not happy with the esthetic effect. Seven (23%) subjects were operated on again in the follow-up period due to the new manifestation of the nodule in the same or another hand. Two (7%) cases of recurrence at the operation site were noted.

DISCUSSION

Rheumatoid nodules constitute a fairly common problem in the hand surgeon's practice. In patients with diagnosed RA, the character of the lesion arising in the hand is immediately associated with the basic disease. The results of this study show that the majority of nodules which in histological examination appeared to be rheumatoid nodules were found in patients with no history of RA. It is an interesting finding which shows that rheumatoid nodules may grow in persons who are not burdened with the systemic disease. It cannot be determined if the disease would not develop in these patients in the future, but it is more probable that rheumatoid histological character of the lesion was accidental, and not related to the systemic disease. The results of this study show good outcomes of the surgical treatment of rheumatoid nodules in the hands and justify this approach.

The pathogenetic mechanisms that lead to the development of rheumatoid nodules are not well-known. One of the theories suggests that these are lesions mediated by immune complexes. Immunohistochemical studies show that their formation, as well as fibrin deposits, are secondary to the complement activation due to the aggregation of IgM-RF on the endothelial cell surface after a vascular injury, resulting in the formation of immune complexes. This process occurs between the true skin and subcutaneous tissue, at the site of recurrent mechanical pressure or trauma. It has been reported that methotrexate or leflunomide therapy of RA may accelerate the development of rheumatoid nodules.

Rapid onset and worsening of nodules have been observed in chronic RA patients treated with methotrexate [1, 3].

Histological appearance of rheumatoid nodule

Rheumatoid nodule characterized by the regular pattern of 3 zones (Fig. 4): a central area of fibrinoid necrosis with streaks and granules (marked with No. 1); a surrounding area with

palisading macrophages, displaying an increased expression of HLA-DR antigen (marked with No. 2); and a peripheral area showing perivascular inflammation composed of lymphocytes, plasma cells and histiocytes (marked with No. 3). Necrobiosis with fibrin deposition and palisading epithelioid histiocytes is a typical histological feature of rheumatoid nodules [3, 4].

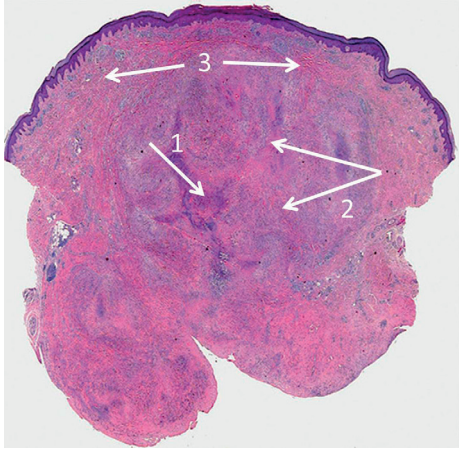


FIGURE 4. Histological pattern of the rheumatoid nodule (haematoxylin staining)

There is scarce literature on the management of rheumatoid nodules. Bang et al. analysed the clinical status and course of RA in 57 patients at the mean age of 57 years (range 39–70) who presented also with nodules in the extremities. The average duration between the onset of treatment and the occurrence of a rheumatoid nodule was 11 years. The foot, hand, and wrist, in order of decreasing frequencies, were the anatomical sites with the highest occurrence of the lesions. All patients were treated with disease-modifying antirheumatic drugs and most of the patients showed high-positive rheumatoid factor or high-positive anti-citrullinated protein antibodies. All nodules were resected: in 36 patients due to pain and/or deformity of fingers (toes) and in 18 patients due to the possibility of neoplastic disease or benign cystic lesion. Unfortunately, the authors do not report the functional results and recurrence in the follow-up period [4].

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