

Granuloma Annulare Mimicking Dorsal Knuckle Pads

Chad M. Myeroff, MD, Peter J. Stern, MD

A 37-year-old man underwent excision of what was presumed to be knuckle pads associated with Dupuytren disease. The histology revealed granuloma annulare, which is typically treated nonsurgically. This report includes a discussion of granuloma annulare and its differentiation from knuckle pads. (*J Hand Surg* 2011;36A:1039–1041. Copyright © 2011 by the American Society for Surgery of the Hand. All rights reserved.)

Key words: Dorsal knuckle pads, Dupuytren disease, excision, Garrod's nodules, granuloma annulare.

KNUCKLE PADS (KPs) have been associated with Dupuytren disease since Garrod made the observation in 1904.¹ Knuckle pads are usually slowly progressive, painless dermal nodules/subcutaneous lesions that may precede Dupuytren disease and are a frequent factor in the Dupuytren diathesis.^{2,3} Once diagnosed, they are usually monitored clinically and excised only if the patient requests owing to discomfort or displeasing appearance, because recurrence is common. Before excision, the surgeon should be aware of the differential diagnosis for this benign condition. We present a case of localized granuloma annulare (GA) mistaken for knuckle pads before excisional biopsy.

CASE REPORT

A 37-year-old, right-handed man of Irish descent presented with small soft tissue masses on the dorsum of his left middle finger proximal interphalangeal (PIP) joint and right middle and ring finger PIP joints that slowly developed over 7 months. There was no history of trauma and he was in excellent health. The mass on the left middle finger PIP joint was irritating as a result of pain on contact. The patient denied fibromatosis involving the penis or plantar surface of the foot or a family history of Dupuytren disease. Examination of

the affected fingers revealed thickened, nontender swellings over the dorsum of the PIP joints. There was no discoloration or dermal breakdown. There was full range of motion of the affected digits. A commissural cord was palpated in the first web space of the patient's left hand. There were no visible or palpable palmar cords. The patient was diagnosed with KPs associated with early Dupuytren disease and was advised to leave them untreated.

Seven months later, the patient returned with increased discomfort and tightness of the hands every morning, which resulted in difficulty making a fist. He also reported difficulty putting the hands in his pockets because the lesions were bulky and tender. On examination, full active and passive range of motion remained in all digits despite the development of an additional skin pad just distal to the metacarpophalangeal (MCP) joint on the right index finger. In addition, an early pretendinous cord was now palpable bilaterally over the ring fingers and palm. This was presumed to be an early Dupuytren disease with full active range of motion in both middle fingers. The right hand pads measured 2.0×1.5 cm each and the left measured 1.5×1.5 cm. Marginal excision of thickened gristle-like soft tissue from both middle fingers and the right ring finger was performed down to, but without disturbing, the dorsal tendon apparatus. Pathologic evaluation noted that all specimens contained fibroconnective tissue with necrobiotic granulomas, consistent with GA without evidence of fibromatosis or malignancy and negative for fungi and mycobacterial organisms (Fig. 1). The patient was informed about the risk of recurrence. Sixteen months postoperatively, he presented with a recurrence of identical painful lesions over the right index and ring fingers as well

From the Department of Orthopaedic Surgery, University of Cincinnati College of Medicine, Cincinnati, OH.

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Corresponding author: Chad M. Myeroff, MD, 231 Albert Sabin Way, MSB-5502, Cincinnati, OH 45267-0212; e-mail: chad.myeroff@gmail.com.

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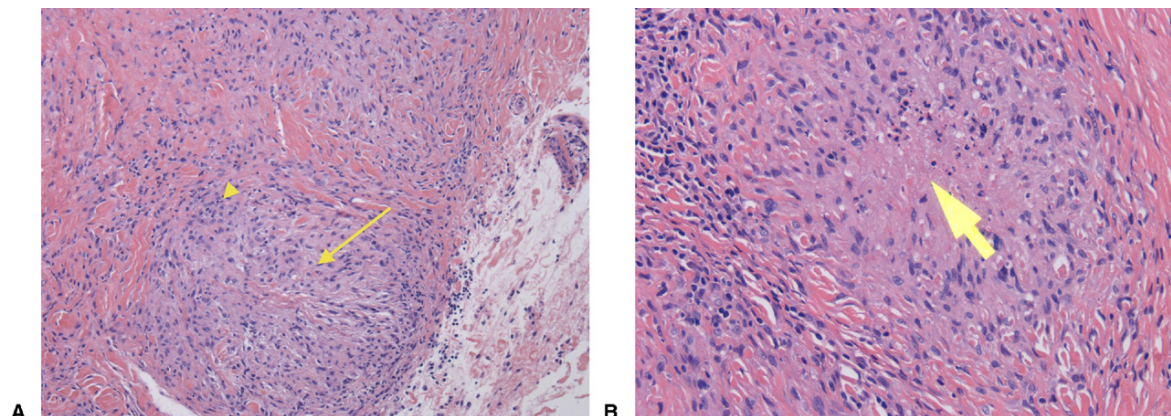


FIGURE 1: **A** Intermediate view showing nodules of pink or pale epithelioid histiocytes palisading (arrowhead) around fibrinoid degeneration of collagen (central necrobiosis) (arrow) (hematoxylin-eosin stain; magnification $\times 100$). **B** High-power view showing epithelioid granulomas with central necrobiosis (arrow) with an absence of giant cells (hematoxylin-eosin stain; magnification $\times 200$).

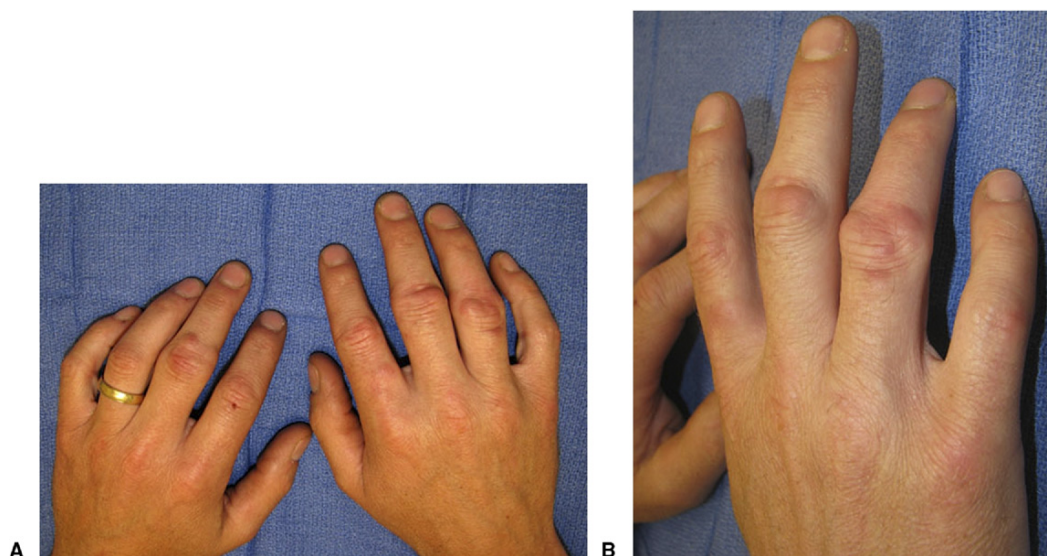


FIGURE 2: **A** Photograph of recurrent GA involving the dorsum of multiple PIP joints of both hands. **B** Close-up photograph of recurrent GA involving the dorsum of multiple PIP joints on the right hand.

as both middle fingers (Fig. 2). The patient was then referred to a dermatologist for management of GA; however, he did not keep the appointment.

At 23 months postoperatively, all of the GA nodules had resolved spontaneously except for 1 on the left middle finger, which was asymptomatic and reduced in size. There was no progression of the palmar Dupuytren disease and all fingers had full motion.

DISCUSSION

Garrod¹ described KPs in 1904 and associated them with Dupuytren disease. Occurring in 9% to 11% of the general population,⁴ it is now known that they are 4 times more common in patients with Dupuytren dis-

ease, with a prevalence ranging from 20% to 49% depending on geographic area.^{4,5} There is a statistically significant greater number of patients with the combination of Dupuytren disease and KPs who also have Ledderhose disease, Peyronie disease, or both, compared with those with Dupuytren disease alone,⁵ all of which are classified histologically as fibromatosis. Knuckle pads usually develop dorsally over the PIP joints, most commonly over the index finger of the right hand, and 81% have associated bilateral Dupuytren disease.⁵ The pads are common in Scandinavians and in all groups increase in frequency with age.² Patients are usually not aware of the pads but may seek excision for aesthetic reasons or for tenderness.

Knuckle pads are usually painless, firm dermal nodules, most often found over the PIP joint; MCP joint and DIP joint nodules are also reported.⁶ They are superficial to the dorsal tendon apparatus and may adhere to the tendon and thus are rarely mobile.^{2,5,7} The nodules are firm, smooth, round, or ovoid and may have overlying hyperpigmented skin. They progress slowly and can regress spontaneously. The tissue consists of a dense fibrous matrix with fibroblasts and myofibroblast proliferations and is histologically identical to palmar Dupuytren nodules; uniquely, however, KPs do not contract.^{2,5,7,8} Excision should not be considered unless the patient has difficulty removing a ring, there is pain on contact, or the patient is concerned about the appearance of the finger. Recurrence is frequent and may be decreased with a skin graft.⁷

Given the confusion over nomenclature in the literature, a prospective study by Rayan et al⁹ proposed precise definitions and categorized 2 unrelated lesions into dorsal Dupuytren nodules (subcutaneous, solid, tumorlike masses over the PIP joints that are pathognomonic of Dupuytren disease and similar histologically to palmar nodules) and dorsal cutaneous pads (painless cutaneous thickening, sclerosis, and loss of skin elasticity and creases over the PIP and MCP joints, without subcutaneous nodules, with similar prevalence among patients with and without Dupuytren disease). Although the etiology of dorsal cutaneous pads is speculative, we would categorize our patient as having neither dorsal Dupuytren nodules nor dorsal cutaneous pads; rather, his nodules were proven histologically to be GA.

Granuloma annulare was described in the late 19th century and is also of unknown etiology.^{10,11} It has been postulated, without good evidence, to result from a delayed hypersensitivity reaction and cell-mediated immune response secondary to tuberculosis, human immunodeficiency virus, Epstein-Barr, or *Varicella zoster* viruses.¹⁰ Other possible origins include insect bites, malignancy, and trauma.^{10,11} The onset is usually within the first 3 decades of life and it has a 2.5:1 female-to-male ratio.^{10,11} The condition resolves in 50% of patients between 2 weeks and 2 years but can recur in 40% of patients, usually at the same site.¹⁰

Overall, GA represents a benign and asymptomatic condition, so named because of its self-limited papular eruptions that can form annular rings. They are usually skin colored or red and the eruption is usually painless without affecting the epidermis. It may present as the localized version (as in our patient) typically occurring on the dorsum of the MCP joint of the middle and ring fingers with lesions approximately 1 cm in diameter. Surgical biopsy is necessary for a definitive diagnosis. The localized form represents 75% of cases in which

lesions are usually found over the lateral and dorsal portions of the hands and feet.¹¹ Histological sectioning shows focal dermal areas of fibrinoid collagen degeneration (necrobiosis) surrounded by palisading histiocytes and perivascular lymphocyte infiltration (Fig. 1). Biopsy is ideally viewed under low power to differentiate GA from rheumatoid nodules, which classically show lymphoid follicles in addition to germinal centers on staining. An absence of giant cells is critical to differentiate GA from infectious etiologies. As seen in our patient, the condition is self-limited, usually resolving in 1 to 2 years, and should be treated with reassurance in most cases.¹² If necessary, the lesions can be treated with intradermal or topical steroids or cryotherapy. Lesions injected with triamcinolone acetate showed 70% clearance versus only 44% with placebo.¹³ Whereas recurrence was equal, the scar was more unsightly in the steroid group.¹³ The recurrence rate is 19% after surgery.¹⁴

In our patient, GA was mistaken for KPs because it occurred primarily over the PIP joint, in a male patient with signs of early Dupuytren disease. Granuloma annulare is typically seen over the MCP joint and most commonly occurs in female patients. In retrospect, it is important to consider the differential diagnosis in these cases owing to the difference in treatment modalities. Given the clinical picture of progressive symptoms and the likely association with early Dupuytren disease, we believed surgical excision was justified.

REFERENCES

1. Garrod AE. Concerning pads upon the finger joints and their clinical relationships. *BMJ* 1904;2:8.
2. Lagier R, Meinecke R. Pathology of "knuckle pads." Study of four cases. *Virchows Arch A Pathol Anat Histol* 1975;365:185-191.
3. McIndoe A, Beare RL. The surgical management of Dupuytren's contracture. *Am J Surg* 1958;95:197-203.
4. Mikkelsen OA. Knuckle pads in Dupuytren's disease. *Hand* 1977; 9:301-305.
5. Caroli AP, Zanasi S, Marcuzzi A, Guerra D, Cristiani G, Pasquali Ronchetti I. Epidemiological and structural findings supporting the fibromatous origin of dorsal knuckle pads. *J Hand Surg* 1991;16A:258-262.
6. Hueston JT. Some observations on knuckle pads. *J Hand Surg* 1984;9B:75-78.
7. Hueston JT. Dupuytren's contracture. *Curr Orthop* 1988;2:173-178.
8. Irwin LR, Naylor IL, Holms W. The contractility of knuckle pads. *J Hand Surg* 1997;22B:110-112.
9. Rayan GM, Ali M, Orozco J. Dorsal pads versus nodules in normal population and Dupuytren's disease patients. *J Hand Surg* 2010;35A: 1571-1579.
10. Muhlbauer JE. Granuloma annulare. *J Am Acad Dermatol* 1980;3: 217-230.
11. Cyr PR. Diagnosis and management of granuloma annulare. *Am Fam Physician* 2006;74:1729-1734.
12. Grant I, Mohammed P, Mahaffey PJ. Granuloma annulare in the hand. *J Hand Surg* 2002;27B:556-558.
13. Sparrow G, Abell E. Granuloma annulare and necrobiosis lipoidica treated by jet injector. *Br J Dermatol* 1975;93:85-89.
14. Felner EI, Steinberg JB, Weinberg AG. Subcutaneous granuloma annulare: a review of 47 cases. *Pediatrics* 1997;100:965-967.