

Heberden's Nodes

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Osteoarthritis is the most common type of arthritis and is a major cause of morbidity and disability, particularly among the elderly.¹ Once regarded as simply a degenerative disease affecting articular cartilage, it is now considered to involve abnormal synthetic and degradative processes. Symptoms of osteoarthritis include joint pain, morning stiffness, and loss of motor function. Clinical signs of the disease include crepitus, joint effusion, and Heberden's nodes. Heberden's nodes, bony growths on the terminal interphalangeal joints of the fingers (**Figure 1**), can be one of the most obvious outward manifestations of osteoarthritis. Indeed, the classic image of osteoarthritis is one of stiff-looking hands with bent fingers afflicted with Heberden's nodes. This article describes Heberden's nodes, the history behind their first description, as well as their overall clinical significance.

HISTORICAL PERSPECTIVE

William Heberden, Sr (1710–1801) was trained in medicine at St. John's College in Cambridge, England and received his medical degree in 1739. He went on to practice medicine and hold lectures on medical topics in Cambridge and was eventually admitted as a fellow of the Royal College of Physicians of London in 1746. He became a well respected teacher, scholar, and orator and made numerous notable contributions to the field of medicine until his retirement in 1782.

Heberden was very much opposed to the so-called "quack remedies" of his day, including blood-letting, purging, and excessive sweating, although such practices were commonly performed at that time. His dedication to strict analytical observation and the versatility of his clinical accomplishments earned him the title, "father of clinical observation."²

One significant and well-known contribution Heberden made to medicine was his description of angina pectoris in 1768 in an article entitled, "Some Account of a Disorder of the Breast."³ He described a malady in which patients "were seized with a most disagreeable sensation in the breast while walking," and he noted

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Enlargements of the terminal interphalangeal joints of the fingers. Heberden's nodes are typically associated with osteoarthritis.

that many of these patients were men over 50 years of age and usually overweight. His description of angina pectoris is still considered accurate to this day.

Heberden also studied patients with chicken pox, hypersensitivity vasculitis, diabetes, and osteoarthritis. In 1803, Heberden's son, William Jr, published a 518-page compilation of his father's notes. The work included a description of Heberden's nodes, which William Sr called "digitorum nodi," describing them as follows:

What are those little hard knobs, about the size of a small pea, which are frequently seen upon the fingers, particularly a little below the top near the joint? They have no connection with the gout, being found in persons who never had it: they continue for life: and being hardly ever attended with pain, or disposed to become sore, are rather unsightly than inconvenient, though they must be some little hindrance to the free use of the fingers.⁴

Other descriptions of Heberden's nodes were subsequently made by various authors—but none so eloquent and clinically accurate as Heberden's.

DESCRIPTION

Today, Heberden's nodes are often described as enlargements of the terminal (or distal) interphalangeal joints of the fingers (**Figure 2**), although a clear

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Figure 1. Hand of an individual with Heberden's nodes, as associated with osteoarthritis. (Reprinted from the Clinical Slide Collection on the Rheumatic Diseases, © 1991, 1995. Used by permission of the American College of Rheumatology.)

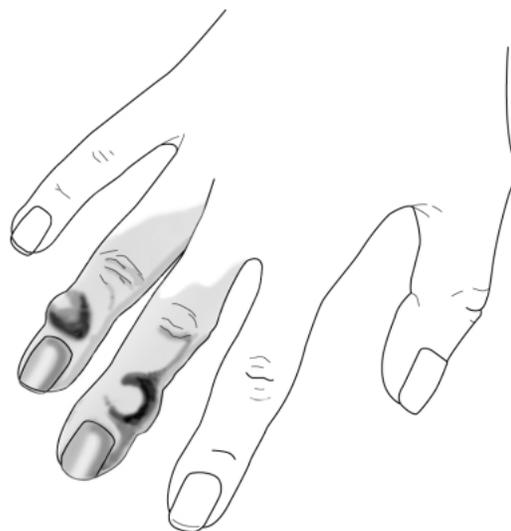


Figure 2. Artistic rendition of Heberden's nodes, emphasizing the site where they typically develop, the terminal interphalangeal joints of the fingers.

definition is lacking in the rheumatologic literature. The histologic nature of the nodes is unknown.

ASSOCIATION WITH OSTEOARTHRITIS

Heberden's nodes are typically associated with hypertrophic arthritis or osteoarthritis. They normally do not arise during the acute stage of osteoarthritic development, but rather during the chronic stage.⁵ In the acute stage, joints become erythematous, warm, and very tender to the touch. At this point, the joints are usually slightly swollen and may exhibit effusion. In addition, during the acute stage, pain in the area of the joints is often severe, occurring in spasms and with the sensation of burning and tingling in the skin overlying the joints. After several months, once the individual is in the chronic stage, the signs of inflammation disappear and bony outgrowths (or Heberden's nodes) begin to arise over the terminal interphalangeal joints of the fingers. At this time, the joints are generally painless, and the characteristic deformation associated with Heberden's nodes becomes obvious.

Heberden's nodes are sometimes used as a marker of osteoarthritis, their presence often indicating generalized osteoarthritis. However, a recent study has challenged this role for Heberden's nodes⁶: the researchers were investigating the possibility of a correlation between the presence of Heberden's nodes and of immature distal interphalangeal (DIP) osteophytes (which are observed radiographically) in the hands of individuals with osteoarthritis. They also examined the roles of Heberden's nodes and immature DIP osteophytes as markers of osteoarthritis in other joints, particularly the knee, in middle-aged women.

The researchers found poor correlation between the presence of Heberden's nodes and of DIP osteophytes, indicating that the two types of outgrowths are not the same entity. Moreover, they found that immature DIP osteophytes were more specific than Heberden's nodes (81% vs 52%) as indicators of osteoarthritis in other joints and had a better positive predictive value as well (61% vs 41%). This led the investigators to conclude that the radiographic observance of immature DIP osteophytes is a better way of detecting generalized osteoarthritis than is the observance of Heberden's nodes. Also, they stated that Heberden's nodes in and of themselves are not necessarily a good marker of generalized osteoarthritis, because of their poor overall positive predictive value for osteoarthritis (26%).⁷ However, they conceded that Heberden's nodes can be an "imperfect surrogate" marker when radiographs are unavailable or impractical to obtain.

Another study examined the results of efforts to diagnose osteoarthritis of the knee clinically with those of attempts to do so radiographically.⁸ Clinical criteria for which subjects were examined included pain, stiffness, joint swelling and effusion, Heberden's nodes, and limitation of knee function. The radiographic indications were considered to be the presence of osteophytes and joint-space narrowing in the knee area. None of the signs or symptoms studied was found to be superior to the results obtained from a radiographic examination in detecting knee osteoarthritis. However, 14 of the 18 clinical criteria had a substantial positive

association with osteoarthritis of the knee and could at least be useful in the diagnosis. Heberden's nodes, however, were not among the 14 with a substantial positive association, having a sensitivity of only 17% to 24% and a positive predictive value of only 29% to 53%.

ASSOCIATION WITH OTHER CONDITIONS

Although Heberden's nodes are typically associated with osteoarthritis, they have been ascribed to other conditions, as well. In one study,⁷ the development of Heberden's nodes often was directly related to the traumatic injury of a finger. After the injury occurred, the finger became painful and swollen. This resolved over the course of several months, but the end-result of the injury was the formation of a Heberden's node. Heberden's nodes formed through this means are specifically termed *traumatic* Heberden's nodes and occur most often in patients who perform manual labor.

The same study⁷ also reported some Heberden's nodes that developed without any precipitating cause. They developed from small cystic swellings on the sides of the interphalangeal joints, which contained a viscous white fluid.⁹ Eventually, these swellings developed into larger nodes that were both sensitive and tender to the touch. This acute presentation would, over time, subside, and the patient would be left with Heberden's nodes. Interestingly, when hydrocortisone was injected into the cystic swellings early on in the clinical course, the inflammation rapidly abated, and no nodes formed.

A relatively recent report¹⁰ described 5 patients with osteoarthritis and Heberden's nodes who developed gout in the nodes. These patients all had documented cases of gout involving the distal interphalangeal joints of the hands, and in the 3 patients on whom aspirations were performed, negatively birefringent crystals were observed in the joint aspirate, consistent with gout. This led the researchers to believe that the gout was related to the Heberden's nodes. They also speculated that the development of gout in the Heberden's nodes of these patients was due, in part, to their pre-existing osteoarthritis.

Another author reported discovering gout in 2 patients in whom fluid was aspirated from Heberden's nodes.¹¹ These patients also had characteristic gouty attacks and responded to appropriate treatment with anti-inflammatory drugs. It was not clear if the patients developed urate deposition in pre-existing Heberden's nodes, or if urate deposition around the interphalangeal joints was the primary event. This distinction is important to accurately determine whether gout can cause Heberden's nodes, an association that remains unclear at this time.

It is generally believed that rheumatoid arthritis does not affect the terminal interphalangeal joints, but in one study, patients with rheumatoid arthritis were noted to have soft-tissue swellings in these joints that were indistinguishable from Heberden's nodes. The study compared results from both clinical and radiographic evaluations of 40 patients with osteoarthritis, 100 patients with rheumatoid arthritis, and 42 control patients. In 76% of the patients with rheumatoid arthritis, probable Heberden's nodes were detected.¹²

Menopause has been speculated to be related to the development of Heberden's nodes.⁷ Stecher found that there was an association between the two in a study involving 99 women. In this group, Heberden's nodes developed within 3 years of menopause in 60% of the patients, leading the author to conclude that "...these events [Heberden's nodes and menopause] have aetiological factors in common," and that "...the climacteric has to be considered as a contributory though important factor in their production." He did note, however, that both menopause and Heberden's nodes are "manifestations of the aging process," and intuitively, this seems to be the likely cause of the association between the two events.

NODULES THAT RESEMBLE HEBERDEN'S NODES

Some conditions may involve the distal interphalangeal joints and result in pathologic changes that resemble Heberden's nodes. For example, both psoriatic arthritis and hypertrophic pulmonary arthropathy may affect the distal interphalangeal joints of the fingers and produce nodules that resemble Heberden's nodes. However, these diseases usually have other systemic manifestations that can help distinguish these nodules from Heberden's nodes.⁹

Diffuse idiopathic skeletal hyperostosis (DISH) is a systemic condition characterized by the abnormal ossification of ligaments, tendons, and joint capsules, and it has been associated with the development of palpable finger nodules similar to Heberden's nodes.¹³ Patients with DISH who develop finger nodules are more likely to have been involved in physically intense work, suggesting that mechanical factors may play a role in their development; a case report on a seamstress who developed nodules that resembled Heberden's nodes but who had no other evidence of osteoarthritis¹⁴ supports this assumption.

CONCLUSION

Heberden's nodes are a clinical sign typically associated with osteoarthritis, but their role as a marker of generalized osteoarthritis has recently been questioned.

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Moreover, they have been observed in association with other conditions; their description, etiology, and usefulness are still being delineated. They remain a somewhat useful adjunctive diagnostic criterion for osteoarthritis. However, at least until a clearer definition is determined, their usefulness will be limited, despite the fact that they can be easily recognized. **HP**

REFERENCES

1. Creamer P, Hochberg MC. Osteoarthritis. *Lancet* 1997; 350:503-8.
2. Bendiner E. William Heberden: father of clinical observation. *Hosp Prac* 1991;26:103-6, 109, 113-6.
3. Jay VV. The legacy of William Heberden. *Arch Pathol Lab Med* 2000;124:1751.
4. Stecher RM. Heberden's nodes: the incidence of hypertrophic arthritis of the fingers. *N Engl J Med* 1940;222: 300-8.
5. Kellgran JH, Moore R. Generalized osteoarthritis and Heberden's nodes. *British Medicine Journal* 1952;i:181-4.
6. Cicuttini FM, Baker J, Hart DJ, Spector TD. Relation between Heberden's nodes and distal interphalangeal joint osteophytes and their role as markers of generalised disease. *Ann Rheum Dis* 1998;57:246-8.
7. Stecher RM. Heberden's nodes: a clinical description of osteo-arthritis of the finger joints. *Ann Rheum Dis* 1955; 14:1-10.
8. Claessens AA, Schouten JS, van den Ouweland FA, Valkenburg HA. Do clinical findings associate with radiographic osteoarthritis of the knee? *Ann Rheum Dis* 1990;49:771-4.
9. Heberden's nodes. *Med J Aust* 1966;2:435.
10. Simkin PA, Campbell PM, Larson EB. Gout in Heberden's nodes. *Arthritis Rheum* 1983;26:94-7.
11. O'Dell JR. Gout in Heberden's nodes [letter]. *Arthritis Rheum* 1983;26:1413-4.
12. Campion G, Dieppe P, Watt I. Heberden's nodes in osteoarthritis and rheumatoid arthritis. *Br Med J* 1983; 287:1512.
13. Schlapbach P, Beyeler C, Gerber NJ, et al. The prevalence of palpable finger joint nodules in diffuse idiopathic skeletal hyperostosis (DISH). A controlled study. *Br J Rheumatol* 1992;31:531-4.
14. Turner WH, Collin J. Seamstress's finger: a cause of Heberden's nodes. *BMJ* 1988;297:1636.

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