Surgery Article

HAND
2018, Vol. 13(3) 355–359

DOI: 10.1177/1558944717708030
hand.sagepub.com

Clarification of Eponymous Anatomical Terminology: Structures Named After Dr Geoffrey V. Osborne That Compress the Ulnar Nerve at the Elbow

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Abstract

Background: In 1957, Dr Geoffrey Osborne described a structure between the medial epicondyle and the olecranon that placed excessive pressure on the ulnar nerve. Three terms associated with such structures have emerged: Osborne's band, Osborne's ligament, and Osborne's fascia. As anatomical language moves away from eponymous terminology for descriptive, consistent nomenclature, we find discrepancies in the use of anatomic terms. This review clarifies the definitions of the above 3 terms. **Methods:** We conducted an extensive electronic search via PubMed and Google Scholar to identify key anatomical and surgical texts that describe ulnar nerve compression at the elbow. We searched the following terms separately and in combination: "Osborne's band," "Osborne's ligament," and "Osborne's fascia." A total of 36 papers were included from 1957 to 2016. **Results:** Osborne's band, Osborne's ligament, and Osborne's fascia were found to inconsistently describe the etiology of ulnar neuritis, referring either to the connective tissue between the 2 heads of the flexor carpi ulnaris muscle as described by Dr Osborne or to the anatomically distinct fibrous tissue between the olecranon process of the ulna and the medial epicondyle of the humerus. **Conclusions:** The use of eponymous terms to describe ulnar pathology of the elbow remains common, and although these terms allude to the rich history of surgical anatomy, these nonspecific descriptions lead to inconsistencies. As Osborne's band, Osborne's ligament, and Osborne's fascia are not used consistently across the literature, this research demonstrates the need for improved terminology to provide reliable interpretation of these terms among surgeons.

Keywords: ulnar neuritis, anatomical history, Osborne's band, Osborne's ligament, Osborne's fascia, eponymous terminology, medial epicondyle and olecranon, ulnar nerve compression

Introduction

Compression of the ulnar nerve can lead to pain, numbness, weakness, and disability. Surgical and nonsurgical interventions to decompress the neural elements have been developed to alleviate these symptoms.[34] In 1957, Dr Geoffrey V. Osborne described a particular etiology for ulnar neuritis in which fibrous tissue spanning the 2 heads of the flexor carpi ulnaris (FCU) muscle placed excessive pressure on the nerve and decompression of this tissue alleviated the symptoms.[29] In 1959, Osborne further characterized this fibrous tissue.[30] Since these original papers, 3 eponymous names have emerged: Osborne's band, Osborne's ligament, and Osborne's fascia. As anatomical language is changing from eponymous terminology toward descriptive, consistent scientific nomenclature,[10,18] we seek to clarify the definitions of these 3 terms in the present article. We review how each of the terms has been used in the anatomical and surgical literature, and investigate whether the 3 terms are used consistently to describe structures associated with ulnar nerve compression at the elbow.

Materials and Methods

To survey the relevant literature, we conducted an exhaustive online search via Google Scholar and PubMed databases to identify key anatomical and surgical texts that describe these 3 eponymous terms. We searched the following terms separately and in combination: "Osborne's band," "Osborne's ligament," and "Osborne's fascia." Papers were excluded

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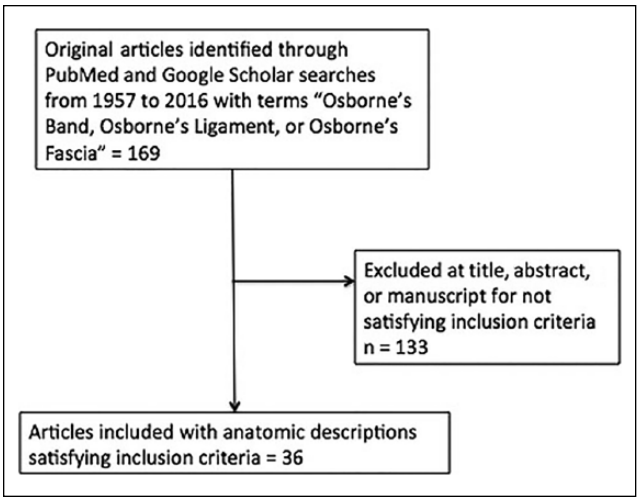

Figure 1. Flow diagram demonstrating selection of articles included in our analysis.

from Google Scholar if they were published prior to 2010 with fewer than 15 citations. Papers were included in this review if the authors provided an anatomical definition of at least one of the eponymous terms we investigated. A total of 36 papers were identified from 1957 to 2016 (Figure 1).

Results

Osborne's Original Description

Dr Osborne wrote 2 key papers in 1957 and 1959 that describe the fibrous tissue compressing the ulnar nerve at the elbow. He discusses a "band of fibrous tissue bridging the two heads of the flexor carpi ulnaris [that] lay directly over the nerve."

He continues to add that the band of compression had an "attachment to the medial epicondyle and . . . to the olecranon."[29] While this description would appear to refer to only the connective tissue between the 2 heads of the FCU muscle, the additional description referring to the medial epicondyle and the olecranon became a source of confusion. The connective tissue between the 2 heads of the FCU muscle extends to the medial epicondyle and the olecranon; however, there is additional connective tissue between the medial epicondyle and the olecranon that can also result in ulnar nerve compression (Figure 2). This structure is more proximal to 2 heads of the FCU muscle (Figure 3). These anatomically distinct sites of compression are inconsistently given eponymous terminology across the literature.

In 1959, Osborne wrote further on this site of compression describing "a band of fibrous tissue bridging the two heads of flexor carpi ulnaris . . . superficial to the nerve, . . . a definite condensation of transversely arranged fibres in the base of the aponeurosis, filling the triangular gap between the two heads of the muscle."[30] In 1970, he wrote a third paper again emphasizing "a transverse band between

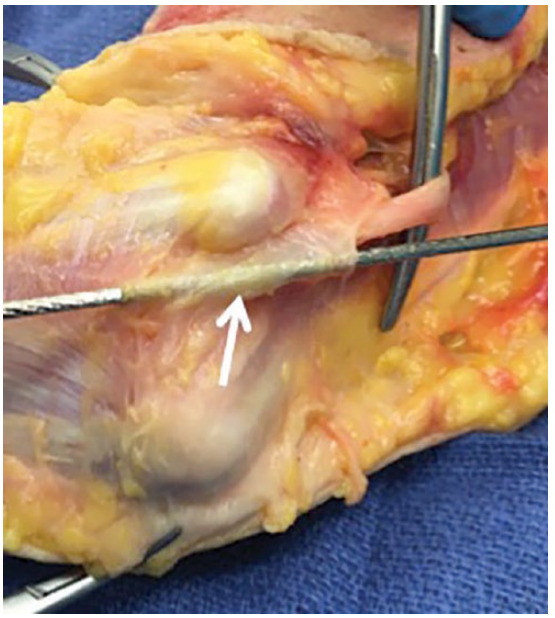

Figure 2. Cadaveric right upper extremity.
Note. Note that the ulnar nerve passes between the medial epicondyle of the humerus and the olecranon. The arrow demonstrates potential site of ulnar nerve compression by the connective tissue between the olecranon and the medial epicondyle. This site of potential compression is proximal to the connective tissue between the 2 heads of the flexor carpi ulnaris muscle.

the heads of the flexor carpi ulnaris" as the source of ulnar nerve compression at the elbow.[28] He did not name the structure after himself in any of these papers, and although he focused his descriptions on compression between the 2 heads of the FCU muscle, he also identified a possible second location of compression by the connective tissue between the medial epicondyle and the olecranon.

The results demonstrating the inconsistencies across "Osborne's band," "Osborne's ligament," and "Osborne's fascia" with regard to either the connective tissue between the medial epicondyle and the olecranon or the connective tissue between the 2 heads of the FCU muscle can be summarized in Table 1. The history and the development of these terms are described below.

Osborne's Band

Fourteen papers describing "Osborne's band" or a "band" of tissue causing ulnar nerve compression at the elbow while citing Osborne's original article were recovered from the literature. Feindel and Stratford's paper first cites Osborne's work describing a "band of fibrous tissue" bridging the 2 heads of the FCU but reports confusion as to which structure Osborne was referencing.[11] Several authors[2,4,6,9,21-23,27,37] would continue to cite Osborne's description of compression by the heads of the FCU muscle. Macnicol[22] in 1979 provided the first eponymous term—"Osborne's lesion."

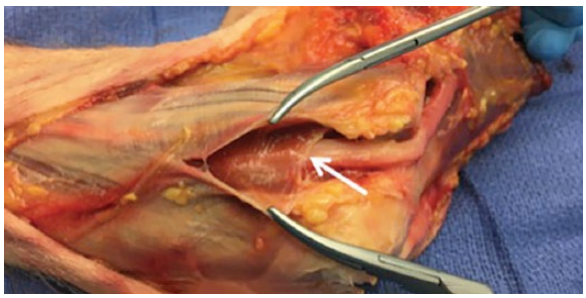

Figure 3. Deeper dissection of the same cadaveric right upper extremity.
Note. The arrow demarcates another potential site for ulnar nerve compression between the 2 heads of the flexor carpi ulnaris muscle. Note that this location is distal to the connective tissue spanning the medial epicondyle and the olecranon.

Dellon[9] in 1986 provided the first use of the term "Osborne's band" by defining the structure as the aforementioned band bridging the heads of the FCU.

On the other hand, Fulkerson et al[12] coined the terms "Osborne's canal" and "Osborne's tunnel" for the space in which the ulnar nerve courses between the connective tissue between the medial epicondyle and the olecranon. In 1991, O'Driscoll et al[26] suggested a new terminology for ulnar neuritis, proposing the term "cubital tunnel retinaculum" (CTR) to denote the structure bridging the medial epicondyle and the olecranon and emphasized that this structure is anatomically distinct from the aponeurosis between the 2 heads of the FCU. Gervasio and Zaccone[13] and Blonna et al[3] described Osborne's band as the CTR, and Gervasio and Zaccone specified that this structure was distinct from the connective tissue between the 2 heads of the FCU muscle. It is evident that 2 distinct genealogies of eponymous terms formed, the first describing the band between the FCU muscle and the second describing the connective tissue between the medial epicondyle and the olecranon.

Osborne's Ligament

Thirteen papers were identified describing "Osborne's ligament." The study by Kleinman[20] was the earliest reference found to have used this terminology, defining "Osborne's ligament" as the roof of the bony retrocondylar groove at the elbow between the medial epicondyle and the olecranon rather than the 2 heads of the FCU muscle. However, several authors[1,8,13,15,19,25,32] each used "Osborne's ligament" to denote the thickened band between the humeral and ulnar heads of the FCU. Gervasio and Zaccone equated Osborne's ligament to Osborne's band, while emphasizing that the CTR was anatomically distinct.[13] In contradiction, Karatas et al described Osborne's ligament as the CTR defined as the connective tissue between the 2 heads of the FCU muscle.[19] Other authors[7,16,17,33,38,39] described Osborne's ligament as a connective tissue between the medial epicondyle and the olecranon. In particular, 3 authors[7,16,33] emphasized that Osborne's ligament was distinct from Osborne's fascia, in which Osborne's fascia was the structure between the 2 heads of the FCU muscle. These papers further demonstrate that 2 distinct anatomical structures, the connective tissue between the 2 heads of the FCU muscle and the tissue between the olecranon and the medial epicondyle, are both referred to inconsistently across the literature as Osborne's ligament.

Osborne's Fascia

Nine papers were identified describing "Osborne's fascia." Three authors[14,24,36] each defined Osborne's fascia as synonymous with the term CTR defined by O'Driscoll et al[26]—the connective tissue between the medial epicondyle and the olecranon. On the contrary, 2 authors[5,31] described Osborne's fascia as the connective tissue between the 2 heads of the FCU. As mentioned above, 3 authors[7,16,33] each described Osborne's fascia as distinct from Osborne's ligament; however, Osborne's fascia was consistently described as the distal ligament extending between the 2 heads of the FCU. Poujade et al[35] distinguished Osborne's fascia as not only the fascial structure connecting the humeral and ulnar heads of the FCU but also a distinct extension of the CTR. Within these 9 citations, "Osborne's fascia" is used to denote 2 distinct structures: either the connective tissue formed by the olecranon and the medial epicondyle, or the anatomically distinct fibrous tissue between the 2 heads of the FCU.

Discussion

This review of the anatomic literature demonstrates that the terms "Osborne's band," "Osborne's ligament," and "Osborne's fascia" are not used consistently. It is clear that the original pathology described by Osborne in his 1957, 1959, and 1970 papers referred to the transverse band of tissue between the 2 heads of the FCU, but his original 1957 paper also indicates the possibility of another structure, the connective tissue between the olecranon and the medial epicondyle. Both these connective tissue bands, the structure between the 2 heads of the FCU and the anatomically distinct structure between the olecranon and the medial epicondyle, have been referred to as Osborne's band, Osborne's ligament, and Osborne's fascia.

Despite the rich history eponymous terms provide, this review demonstrates the potential for confusion when eponymous terminology is used in preference to clear, anatomically defined terms.[10,18] Moreover, the surgical consequences of imprecise communication about the anatomical basis of pathology may result in failure to treat symptomatology appropriately.

To clarify these structures for future use, we suggest moving beyond the use of eponymous terms to describe ulnar nerve compression at the elbow. Instead, clear

Table 1. Summary of Findings.

	Connective tissue between the 2 heads of the FCU muscle	Connective tissue between the medial epicondyle and the olecranon
"Osborne's band" or a "band" of tissue causing compression	Apfelberg and Larson[2] Brown et al[4] Clark[6] Dellon[9] Feindel and Stratford[11] Levy and Apfelberg[21] Macnicol[22] Mahan et al[23] O'Driscoll et al[26] O'Hara and Stone[27] Vanderpool et al[37]	Blonna et al[3] Fulkerson[12] Gervasio and Zaccone[13]
Osborne's ligament	Alcid et al[1] Gervasio and Zaccone[13] Gonzalez et al[15] Karatas et al[19] Mazurek and Shin[25] Palmer and Hughes[32]	Damert et al[7] Henry[16] Hoffmann and Siemionow[17] Kleinman[20] Polatsch et al[33] Wilson et al[38] Yamada et al[39]
Osborne's fascia	Catalano and Barron[5] Damert et al[7] Henry[16] Osterman and Spiess[31] Polatsch et al[33] Poujade et al[35]	Goldfarb et al[14] Martinoli et al[24] Shahabpour et al[36]

Note. FCU = flexor carpi ulnaris.

descriptions of either the connective tissue between the 2 heads of the FCU muscle or the connective tissue between the medial epicondyle and the olecranon should be used. If eponymous terminology must be used, we recommend that Osborne's band, Osborne's ligament, or Osborne's fascia only be used to denote the tissue between the 2 heads of the FCU given that his 3 original papers predominantly describe compression at this location. Moreover, the authors recommend that Osborne's band be the preferred term given the direct language used in the1957 paper.[29] This clarification will help maintain the functional and anatomical distinction of the connective tissue between the 2 heads of the FCU muscle and the connective tissue between the medial epicondyle and the olecranon.

Conclusions

The terms Osborne's band, Osborne's ligament, and Osborne's fascia were not consistently used across the literature and referred to 2 distinct structures: the connective tissue between the 2 heads of the FCU muscle and the connective tissue between the medial epicondyle and the olecranon. This analysis demonstrates the need for more reliable terminology to describe ulnar compression at the elbow.

Authors' Note

This research was presented in the form of an abstract at the American Society for Peripheral Nerve 2017 annual meeting.

Acknowledgment

The authors thank individuals who donate their bodies and tissues for the advancement of education and research.

Ethical Approval

This study was approved by our institutional review board.

Statement of Human and Animal Rights

This article does not contain any studies with human or animal subjects.

Statement of Informed Consent

Informed consent was obtained when necessary

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the National Institutes of Health (NIH), grant number #TL1TR001443. A.R.W. is supported by NIH TL1 predoctoral grant #TL1TR001443.

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