# THE RELATION OF THE MEDIAN NERVE TO THE HEADS OF ORIGIN OF THE PRONATOR TERES MUSCLE[1]

## A Study of 300 Specimens

ROBERT W. JAMIESON, M.D. and BARRY J. ANSON, Ph.D. (Med. Sc.)

### Introduction

In the anatomical literature may be found descriptions of several variations in the constitution of the pronator teres muscles. These reports, in covering the following aberrancies in origin and insertion, usually dealt with a few instances or a single instance each: doubling of the humeral head; insertion into the palmaris longus muscle; splitting of both humeral and ulnar heads of the pronator; complete independence of the ulnar and humeral heads; and occurrence of a third, or supernumerary, head derived from the intermuscular septum. Some striking variations in the relationship between the muscle and the median nerve have also been reported. Among these the following are of interest: passage of the nerve into the forearm superficial to the pronator muscle; coursing of the median nerve between divisions of a split humeral head; passage beneath both heads of origin; and position deep to a supernumerary, third, head of septal origin.

### Material and Methods

To the data reported earlier (Beaton and Anson, 1939[2]), the present authors have added records from the dissection of 60 additional upper extremities and have secured a new series of illustrations prepared from selected specimens.

### Observations and Discussion

Certain of the variations described by other writers were not encountered in the current series. Thus, there was found no instance in which the nerve passed distalward on a level superficial to the entire pronator teres muscle, none in which the pronator joined the palmaris longus, and none in which the median nerve bore no relation to the pronator teres.

The regular form of the pronator teres is that in which the muscle is bicipital, with humeral epicondylar and ulnar coronoid heads, and these portions conjoined to become a tendinous radial insertion. In some instances an ulnar head is wanting (fig. 1e), in others the humeral head is double (fig. 1g). This means that several routes are available for passage of the median nerve from the arm into the forearm.

In 83.3 per cent of the 300 cases, the median nerve passed between the humeral and ulnar heads of the pronator teres (fig. 1d). In 8.7 per cent of the specimens in the series the nerve passed deep to the humeral head of the muscle, and the ulnar head was missing (fig. 1e). In 6 per cent of extremities the median nerve was found to course deep to both heads of the muscle (fig. 1f), while in 2 per cent the nerve split the humeral head and ran superficial to the ulnar head and the remainder of the pronator (fig. 1g).

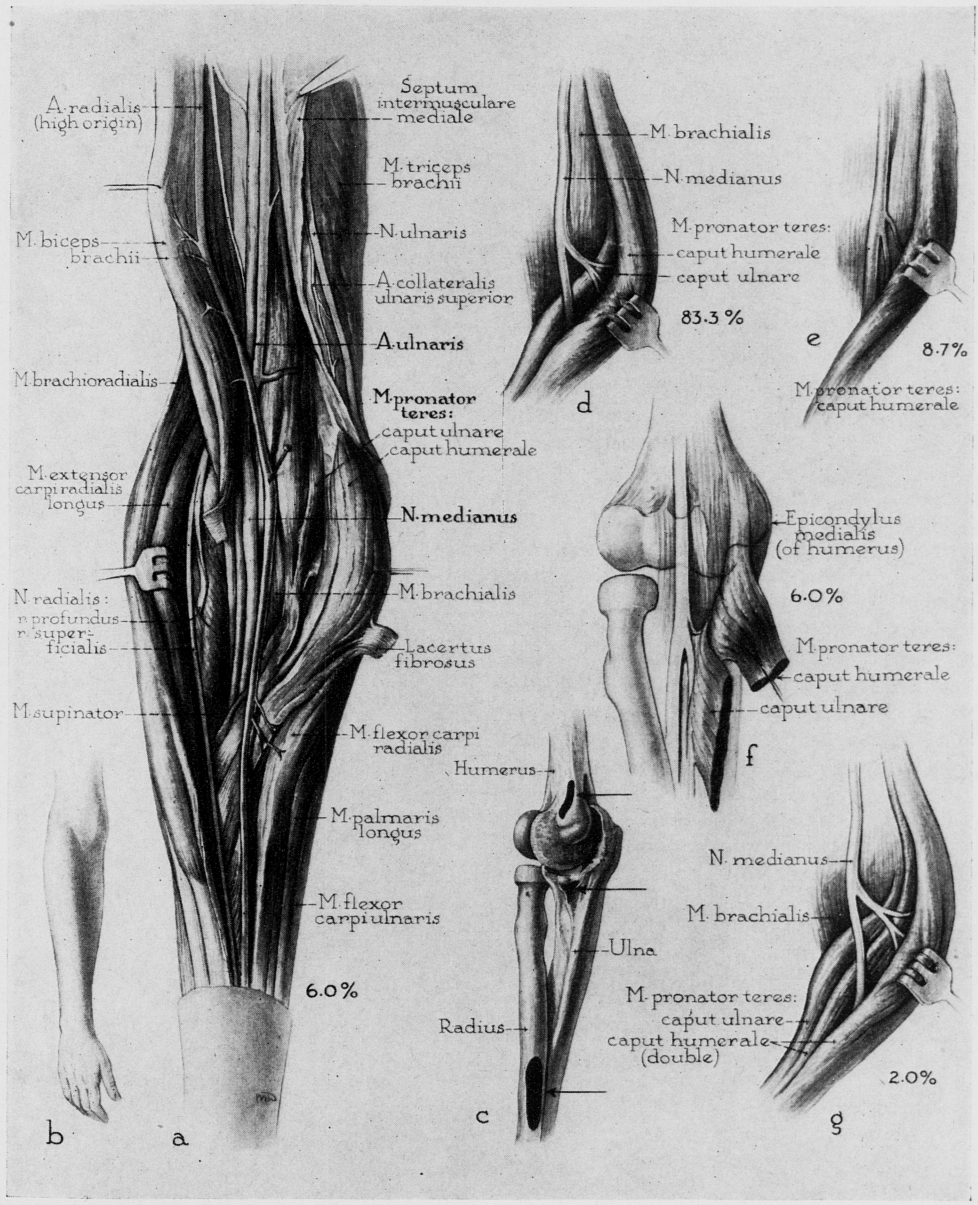
### Summary

Data on 300 specimens are presented, dealing with the form and attachments of the pronator teres muscle and the various ways in which the median nerve may be related to the muscle in passing from the cubital fossa into the depths of the antebrachium.

Variations in nerve-muscle relationship were encountered infrequently, 83.3 per cent of the specimens being in the category of the anatomic norm—the median nerve passing between the superficial (humeral) and the deep (ulnar) heads of the pronator teres muscle. The remaining 16.7 per cent of the specimens represented departures from the preponderant type; in order of decreasing frequency, the nerve passed beneath a humeral head of the pronator (in the absence of an ulnar head), beneath the ulnar head (a humeral head being present), and through a split humeral head (in the presence of a regular ulnar portion).

[1]Contribution No. 581 from the Department of Anatomy, Northwestern University Medical School. Received for publication, December 7, 1951.

[2]Beaton, L. E. and Anson, B. J.: The Relation of the Median Nerve to the Pronator Teres Muscle, Anat. Rec., 75: 23-26, 1939.




*Figs. 1a to 1g. Pronator teres muscle and median nerve, the arm in pronated position, the usual areas of skeletal attachment of the pronator teres and the types of relationship between the muscle and the nerve encountered in 300 specimens, with percentage occurrence of each type.*

*Fig. 1b. The forearm in pronated position. Fig. 1c. The commonest areas of skeletal attachment of the pronator teres muscle: origin, from the medial epicondyle of the humerus and the corresponding aspect of the coronoid process of the ulna; insertion into ventral, lateral and dorsal aspects of the radius at the summit of the latter's chief curve. Fig. 1a. An infrequent type (6 per cent) in which the median nerve passes beneath the ulnar (deep) head of the pronator teres muscle. In this specimen there occurred a high (proximal) division of the brachial artery, to send the ulnar and radial divisions separately into the cubital fossa. Structures have been retracted in order to demonstrate the relationships of muscles, vessels and nerves in the latter region. Fig. 1d. The most frequent type (83.3 per cent), in which the nerve passes between the humeral (superficial) and ulnar (deep) heads of the pronator teres. Fig. 1e. One of the three infrequent types (8.7 per cent) in which the nerve, in the absence of an ulnar head of the pronator, passes to deep level in the antebrachium by coursing distalward under the humeral head. Fig. 1f. An even less common relationship between the pronator teres muscle and the median nerve (as in fig. 1a), in which the nerve courses deep to the regular ulnar head. Fig. 1g. The least common arrangement (2 per cent), whereby, in the presence of an ulnar head, the median nerve passes between subdivisions of a split humeral portion of the pronator teres muscle.*