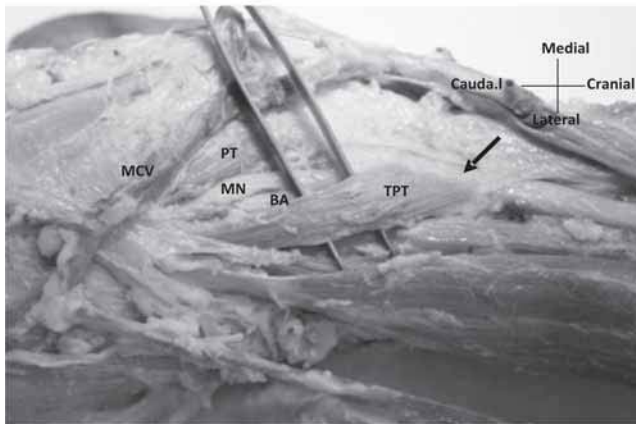


proximal extremity was attached for about 6-7 cm to the medial intermuscular septum. The median nerve and brachial artery were overlapped by this third head of pronator teres (Fig 2). On the other hand right arm pronator teres was normal.



**Figure 2:** Photograph of the anterior compartment of the left arm showing the third head of pronator teres (TPT) taking origin from medial intermuscular septum (arrow). This head overlaps the median nerve (MN) and brachial artery (BA). PT- Pronator teres, TPT- Third head of pronator teres, MN- Median nerve, BA- Brachial Artery, MCV- Median cubital vein.

## DISCUSSION

Although the third head of biceps brachii is a common occurrence in mammals, previous studies in human beings show that the third head of biceps brachii is seen in about 8% of Chinese, 10% of white Europeans, 12% of black Africans, 18% of Japanese, 20.5% of South African blacks, 8.3% of South African whites, 20% of Brazilian whites, 9% of Brazilian blacks, 15% of Turks<sup>3</sup> and merely 2% in the Indian population<sup>4</sup>. Thus, the occurrence of third head of biceps brachii in the Indian population is rare. The third head of biceps brachii in our case originated from the anteromedial surface of the humerus distal to the insertion of the coracobrachialis, passed inferomedial to the main biceps brachii and inserted into the medial side of the bicipital aponeurosis. This additional head also receives its own nerve supply from main trunk of musculocutaneous nerve. The medial humeral origin of the third head may

provide additional strength to the biceps during supination of the forearm and elbow flexion irrespective of shoulder position and it also play a role in straightening of the oblique pull of the biceps tendon. The presence of the third head may cause unusual bone displacement, subsequent to fracture; such variations have relevance in surgical procedures.

Nebot et al, 1994 reported that additional head of pronator teres arose from the tendon of the brachialis muscle (5.0%), from the radial tendon of the biceps brachii muscle (3.3%), from the Gantzer's muscle (1.6%) or from the flexor digitorum superficialis muscle (1.6%)<sup>5</sup>. Tulwa N et al, 1994 reported a case of the pronator syndrome caused by compression of the median nerve by a fibrous band as the nerve passed through the humeral head of origin of pronator teres<sup>6</sup>. This rare anatomical arrangement resulted in displacement of the median nerve to the anterior aspect of the medial humeral epicondyle. Awareness of these variations is necessary to avoid complications during radiodiagnostic procedures or surgeries in the upper limb.

Considering these studies, we found an additional head of pronator teres arising from medial intermuscular septum and overlap the median nerve and brachial artery. Such variations have clinical implications and should be considered in patients, with a high median nerve paralysis with symptoms of lower brachial artery or brachial vein compression.

Although there are individual reports about these variations, the combination of these variations in one cadaver has not previously been described in the literature. In conclusion, these variations are not rare and are interesting not only for anatomists but also to orthopaedic surgeons, plastic surgeons, traumatologists, physiotherapists, doctors dealing with sports medicine and radiologists.

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## LITERATURE REVIEW

### Associations of kidney disease measures with mortality and end-stage renal disease in individuals with and without hypertension: a meta-analysis

Bakhtawar K Mahmoodi, Kunihiro Matsushita, Mark Woodward et al *Lancet* 2012 Nov 10; 380: 1649

**Background:** Hypertension is the most prevalent comorbidity in individuals with chronic kidney disease. However, whether the association of the kidney disease measures, estimated glomerular filtration rate (eGFR) and albuminuria, with mortality or end-stage renal disease (ESRD) differs by hypertensive status is unknown. The authors did a meta-analysis of studies selected according to Chronic Kidney Disease Prognosis Consortium criteria. Data transfer and analyses were done between March, 2011, and June, 2012. We used Cox proportional hazards models to estimate the hazard ratios (HR) of mortality and ESRD associated with eGFR and albuminuria in individuals with and without hypertension. **Findings:** We analysed data for 45 cohorts (25 general population, seven high-risk, and 13 chronic kidney disease) with 1 127 656 participants, 364 344 of whom had hypertension. Low eGFR and high albuminuria were associated with mortality irrespective of hypertensive status in the general population and high-risk cohorts. All-cause mortality risk was 1.1–1.2 times higher in individuals with hypertension than in those without hypertension at preserved eGFR. A steeper relative risk gradient in individuals without hypertension than in those with hypertension at eGFR range 45–75 mL/min per 1.73 m<sup>2</sup> led to much the same mortality risk at lower eGFR. With a reference eGFR of 95 mL/min per 1.73 m<sup>2</sup> in each group to explicitly assess interaction, adjusted HR for all-cause mortality at eGFR 45 mL/min per 1.73 m<sup>2</sup> was 1.77 (95% CI 1.57–1.99) in individuals without hypertension versus 1.24 (1.11–1.39) in those with hypertension (p for overall interaction=0.0003). Similarly, for albumin-creatinine ratio of 300 mg/g (vs 5 mg/g), HR was 2.30 (1.98–2.68) in individuals without hypertension versus 2.08 (1.84–2.35) in those with hypertension (p for overall interaction=0.019). We recorded much the same results for cardiovascular mortality. The associations of eGFR and albuminuria with ESRD, however, did not differ by hypertensive status. Results for chronic kidney disease cohorts were similar to those for general and high-risk population cohorts. **Interpretation:** Chronic kidney disease should be regarded as at least an equally relevant risk factor for mortality and ESRD in individuals without hypertension as it is in those with hypertension. **Funding:** US National Kidney Foundation.

## LITERATURE REVIEW

### Bariatric surgery and prevention of type 2 diabetes in Swedish obese subjects.

Carlsson LM, Peltonen M, Ahlin S, et al *N. Engl J. Med.* 2012 Aug 23;367(8):695-704

Weight loss protects against type 2 diabetes but is hard to maintain with behavioral modification alone. In an analysis of data from a nonrandomized, prospective, controlled study, we examined the effects of bariatric surgery on the prevention of type 2 diabetes. **METHODS:** In this analysis, we included 1658 patients who underwent bariatric surgery and 1771 obese matched controls (with matching performed on a group, rather than individual, level). None of the participants had diabetes at baseline. Patients in the bariatric-surgery cohort underwent banding (19%), vertical banded gastroplasty (69%), or gastric bypass (12%); nonrandomized, matched, prospective controls received usual care. Participants were 37 to 60 years of age, and the body-mass index (BMI; the weight in kilograms divided by the square of the height in meters) was 34 or more in men and 38 or more in women. This analysis focused on the rate of incident type 2 diabetes, which was a prespecified secondary end point in the main study. At the time of this analysis (January 1, 2012), participants had been followed for up to 15 years. Despite matching, some baseline characteristics differed significantly between the groups; the baseline body weight was higher and risk factors were more pronounced in the bariatric-surgery group than in the control group. At 15 years, 36.2% of the original participants had dropped out of the study, and 30.9% had not yet reached the time for their 15-year follow-up examination. **RESULTS:** During the follow-up period, type 2 diabetes developed in 392 participants in the control group and in 110 in the bariatric-surgery group, corresponding to incidence rates of 28.4 cases per 1000 person-years and 6.8 cases per 1000 person-years, respectively (adjusted hazard ratio with bariatric surgery, 0.17; 95% confidence interval, 0.13 to 0.21; P<0.001). The effect of bariatric surgery was influenced by the presence or absence of impaired fasting glucose (P=0.002 for the interaction) but not by BMI (P=0.54). Sensitivity analyses, including end-point imputations, did not change the overall conclusions. The postoperative mortality was 0.2%, and 2.8% of patients who underwent bariatric surgery required reoperation within 90 days owing to complications. **CONCLUSIONS:** Bariatric surgery appears to be markedly more efficient than usual care in the prevention of type 2 diabetes in obese persons. (Funded by the Swedish Research Council and others; ClinicalTrials.gov number, NCT01479452).