

A study on the incidence of the third trochanter of femur in JNIMS, Manipur

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Abstract:

Introduction: The third trochanter of femur is a rounded, oblong or conical elevation present on the upper end of gluteal tuberosity. It may perhaps serve to increase attachment surface area for the gluteus maximus thereby providing greater efficiency of contraction. The present was undertaken on the human femora of the department of Anatomy, JNIMS with the aim to determine the prevalence of third trochanter.

Materials and methods: The study was carried out in 60 human adult dry femora of unknown sexes in the Department of Anatomy, JNIMS, Manipur. The femora were inspected for the presence of third trochanter. If present photographs are taken and prevalence is calculated.

Result: The third trochanter was present in 8 femur bones (13.33%). The of occurrence was 5(16.67%) in left and 3(10%) in right sides.

Conclusion: The occurrence of the third trochanter was 13.33% and was observed to be of higher frequency given the limited numbers of the femora requiring the need to expand the study population of all the available femur bones in Manipur.

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I. INTRODUCTION:

The femur is the longest and strongest bone in the human body. It is a principal weight-bearing bone. The femoral architecture may get altered due to functional demand during any day to day activities. One such variation is the third trochanter of the femur. The third trochanter or trochanter tertius (TT) is an accessory bony protuberance of the proximal femur which is rounded, oblong or conical elevation present on the upper end of gluteal tuberosity. It is located on the posterolateral surface of the bone, distally from the intertrochanteric crest (crista intertrochanterica) and caudally to the greater trochanter. It is closely associated with the gluteal tuberosity. Gluteus maximus inserts on gluteal tuberosity and responsible for extension of thigh and plays an important role in rising from sitting position. When gluteus muscle is overused, it exerts mechanical force on gluteal tuberosity altering its morphology resulting in formation of third trochanter. It may perhaps serve to increase attachment surface area for the gluteus maximus thereby providing greater efficiency of contraction.¹

The present study aims to determine the incidence of third trochanter and compare with the other contemporary studies.

II. MATERIALS AND METHODS:

The study was carried out in 60 human adult dried femora (30 left and 30 right) of unknown sexes in the Department of Anatomy, JNIMS, Manipur. All the femora were examined carefully to see the presence of third trochanter, if present photographs were taken and the prevalence percentages were noted.

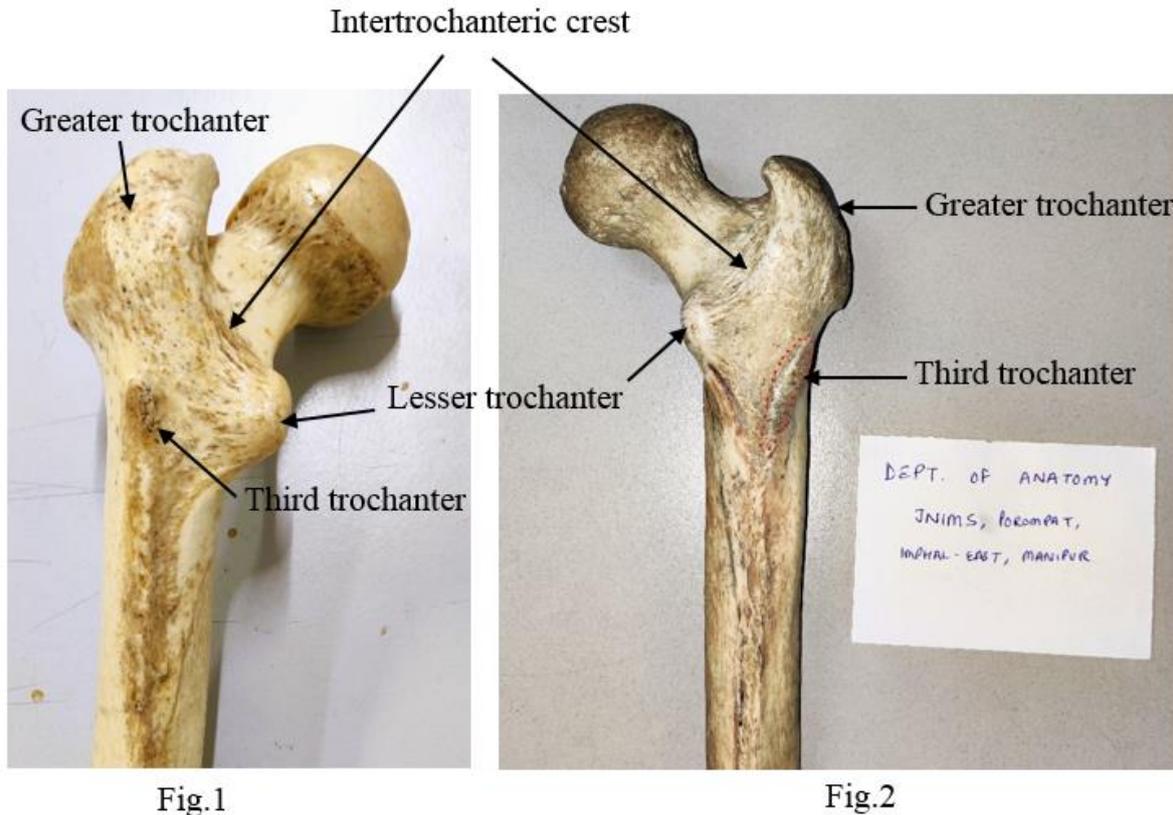


Fig.1 and Fig.2 showing left and right femur with presence of third trochanter respectively.

III. RESULTS:

Of the 60 femora studied the third trochanter was present in 8 bones (13.33%), 5 were in left and 3 in right. So, the prevalence is 16.67% in left and 10% in right respectively.

IV. DISCUSSION:

The incidence of the third trochanter in the present study is found to be 13.33% which is similar to other studies conducted on Pakistani population (13.9%)², on Northern Tamil Nadu population (13.72%)³ and on study by Rajad R⁴ (13%). The incidence was much higher than the study by Ghosh et al⁵ in general Indian population (6.6%), by Bolanowski⁶ on Polish population (6.2%) and on North Karnataka population (4.43%).⁷

Singh R⁸ observed third trochanter in 23 out of total 45 femora constituting 51% of total which was much higher than the reports from previous studies and my present study and left femora was found to be predominant whereas it was left predominance in my study.

Ajita R⁹ observed only one right human femur (Out of 100 human femora) with presence of third trochanter, that is only 1%.

Finnegan M¹⁰ reported the side variations in Whites and Negroes and documented higher incidence on the right side in the White and on the left side in the Negro population and the study also reported that the incidence of the third trochanter in the human femur is about 6.1%.

Sadaf S et al¹¹ also observed that out of 56 femora studied, it was observed that the third trochanter was found in eight bones (14.28%), two belonging to the left side (3.57%) and six to the right (10.71%). Nikolova I A et al¹² also noted for the presence of third trochanter in 21.3% out of which 21.9% were right and 20.9% were left side.

Out of total 200 femora studied, the presence of third trochanter was noticed in 16 (8.0%) femora. Out of which 7 (3.5%) was in right side (R) and 9 (4.5%) in left side.¹³

The incidence of the third trochanter in the present study is 13.33% and the frequency of the third trochanter on the left side is more than the right side.

V. CONCLUSION:

The incidence of the presence of third trochanter is high according to various studies mentioned herewith. The third trochanter may perhaps serve to increase attachment surface area for the gluteal musculature thereby providing greater efficiency of contraction. Gluteus maximus function may exert a mechanical loading on the third trochanter thereby altering surface morphology. The presence of bony crests, ridges and tuberosities are directly correlated to the function of contiguous muscle activity.⁷ The findings of this study has necessitated to conduct a larger study of all the available femur bones in Manipur to estimate the percentage of the third trochanter in order to compare and analyse with other contemporary studies.

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