# AVULSION OF THE LESSER TROCHANTER*

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Strong muscular contractions not uncommonly produce fractures of bone. An avulsion of the lesser trochanter of the femur belongs to this class and because of the rarity of this lesion, the following case is reported.

G. B., aged 14, a colored schoolboy, entered Lakeside Hospital, April 20, 1925, complaining of pain in the left hip. During a game of baseball, the patient had stopped abruptly at second base, and, while attempting to keep his body upright, experienced a sudden severe pain in the left hip which forced him to lie down. Although the injured leg would support the weight of the body, walking was very painful and he had to be carried from the field. He was brought directly to the hospital accident ward. The left thigh was held in ninety degree flexion and any attempt to straighten out the limb produced pain and muscle spasm. Other passive movements of the hip, however, could be performed if carried out slowly and carefully. There was no swelling, but a definite point of tenderness could be elicited when pressure was applied over the lesser trochanter. A determination of the muscular power about the hip was unsatisfactory because of the pain which active movements produced. The abductors were strong but the adductors seemed weakened. Inability to flex the thigh and the associated pain of attempted extension were the outstanding symptoms. General examination was otherwise normal. A roentgenogram of the hip showed an avulsion of the lesser trochanter (Fig. 1). After two days the pain produced on extension of the limb had diminished to such an extent that the patient was able to hold the leg in the extended position without discomfort. There was still some tenderness over the lesser trochanter. Flexion of the hip could not be carried out beyond the forty-five degree angle. The power of adduction remained weakened. Three days following the injury a plaster hip spica cast was applied with the hip fixed in forty-five degree flexion and slight adduction. Several days later the patient was discharged from the hospital and subsequently observed in the dispensary. The cast was removed after seven weeks. One month later the patient had full return of function in the injured limb.

Ruhl [1] was the first to make an exhaustive search in the literature of such cases. Including one case reported by himself twenty-two cases were compiled. More recently Moreau and Lecouturier [2] revised the reported series of Ruhl and discounted three cases with multiple fractures of the same femur. They were able to collect other cases from the literature and including a personally observed case brought the total number to thirty-three. Eikenbary [3] reported three cases, but only one was placed in the list compiled by Moreau and Lecouturier. The other two must be considered questionable because both were examined after a relatively long period of time had elapsed from the date of injury and the x-ray evidence was not conclusive. Langdon[4] has reported an additional case and Heath,[5] Pugh [6] and Carl[7] have since each reported one case. Recently Balensweig [8] reported five cases. The case referred to in this article, therefore, brings the total number of cases reported to forty-three.

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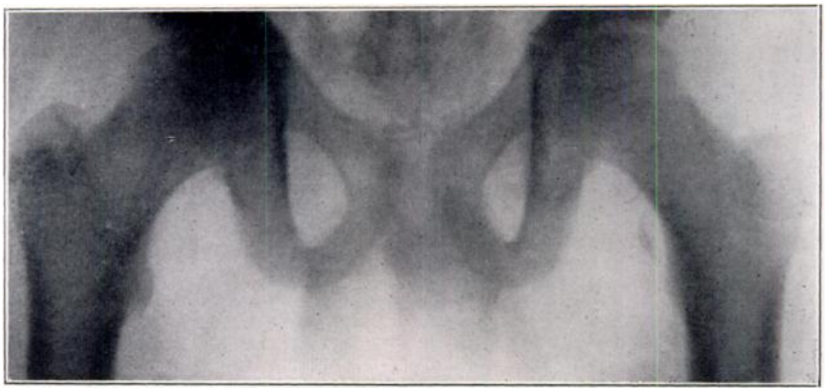

FIG. 1

Roentgenogram of upper femora showing a complete severance of the lesser trochanter of the left femur. There is a marked displacement upwards of the fragment of bone.

*Etiology.* The greatest number of these fractures occur in young people before the epiphysis of the lesser trochanter has fused with the femoral shaft, — the lesion being an epiphyseal separation. A few cases have been reported occurring in elderly individuals, probably the result of an abnormally strong pull of the psoas muscle on the lesser trochanter whose trabecular structure is weakened by rarefaction. The mechanism undoubtedly consists in a tearing off of the lesser trochanter when an effort is made by the psoas muscle to prevent the body trunk from falling forward or backward. This is illustrated in the case reported above. With the leg fixed, an attempt was made to maintain equilibrium in the upright position by such violent psoas contraction that an avulsion and an epiphyseal separation of the attached trochanter resulted.

*Symptomatology.* Among the recorded cases, pain in the affected hip and tenderness over the lesser trochanter are constant features. Swelling in the upper inner thigh may or may not be visible. The patients can usually be made to support the weight of the body on the injured limb. The inability to bring the leg forward and the associated pain may, however, so seriously interfere that walking is either impossible or accomplished with difficulty. Passive movements are not interfered with; active movements are restricted, especially extension, because of pain. Inability to flex the hip when in the sitting position, considered by Ludloff [9] diagnostic of the loss of psoas power, and known as Ludloff's sign is pathognomonic of a complete severence of the lesser trochanter providing all the fibres of the psoas muscle are likewise torn. It is conceivable, however, that some degree of flexion is possible if some periosteal attachments of the trochanter remain intact or if the fibres of insertion of the iliacus muscle prevent a great displacement of the trochanter.

*Diagnosis.* The lesion can easily be recognized by (1) the nature of the injury, (2) a localized point of tenderness over the lesser trochanter,

(3) the inability to flex the hip while in the sitting position, (4) the absence of shortening of the affected limb and (5) the x-ray evidence of a misplaced lesser trochanter.

Good functional results have been attained in all the recorded cases by merely immobilizing the limb. The best results are obtained by fixing the hip in a forty-five to sixty degree position of flexion with a hip spica plaster cast. No interference with function of the psoas muscle will occur if a fibrous instead of a bony union results.

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