

# MODIFICATIONS OF THE NORMAL SONOGRAPHIC IMAGE IN GLUTEAL FIBROSIS

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**There is no reference in the literature to the use of sonography in the diagnosis of muscular fibrosis. In this paper we report the sonographic findings observed in forty patients who had marked limitation of flexion of the hip joint and tightness and atrophy of the gluteal muscles from increased fibrous tissue in the gluteal musculature.**

**Keywords :** sonography ; echography ; gluteal muscular fibrosis ; muscular fibrosis.

**Mots-clés :** échographie ; fibrose musculaire fessière ; fibrose musculaire.

## INTRODUCTION

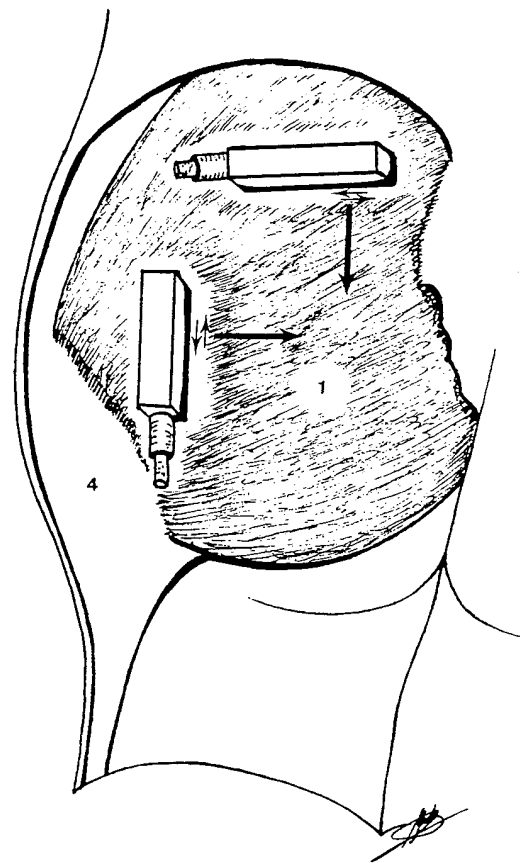
The clinical entity of increased fibrous tissue in the gluteal musculature, and particularly in the gluteus maximus muscle, is referred to as gluteal fibrosis (4). The diagnosis is usually clinical, based on the signs of characteristic functional limitations, whereas the confirmation is made by pathological evaluation of a surgical specimen.

However, no publications address the possibility of using sonography in diagnosis. The purpose of this paper is to describe the normal sonographic image modifications of the gluteal musculature in gluteal fibrosis.

## PATIENTS AND METHODS

Forty patients were examined, including 27 males and 13 females, ranging in age from 8 to 38 years. Thirty-two patients had bilateral involvement, and 8 had fibrosis on one side only. We used a General Electric RT 3000 sonographic unit with a 5-MHz linear

translator. The imager was passed over the buttock as shown in fig. 1.



*Fig. 1.* — Schematic representation of the sonographic examination of the buttocks.

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## RESULTS AND DISCUSSION

There is a correlation between the sonographic image and the pathological findings. The muscular tissue shows an increase in echo density (fig. 2) because of the collagen tissue (fig. 3). According to the histopathologic classification of Esteban (2), in cases of fibrosis or in plates (fig. 4), there is an increase in echogenicity where fibrous condensation is found (fig. 5), causing muscular deformation at this point (fig. 6). The muscular fascia is perfectly delineated because it is highly echogenic. This fact confirms the theory suggested by Pipino (6) which states that this disease begins in the muscular fascia, but when fibrous infiltration of subcutaneous cellular tissue occurs (fig. 6) differentiation can be difficult.

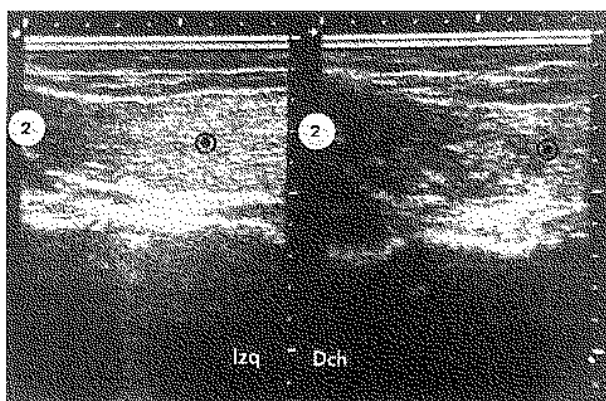


Fig. 2. — Compare the highest echogenic density of the left gluteus medius muscle in relation to the right (normal picture).

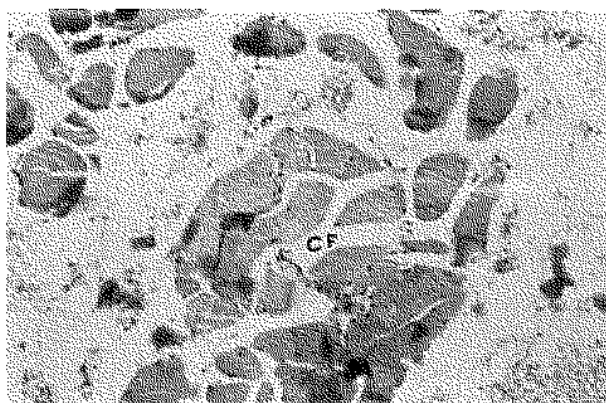


Fig. 3. — The gluteus maximus muscle shows an increase in collagen fibers (CF).

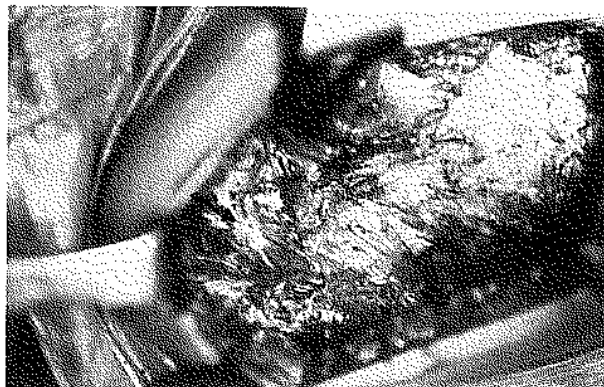


Fig. 4. — Intraoperative view of the gluteus maximus muscle. See the condensation of the fibrous tissue in the muscular fascia (→).

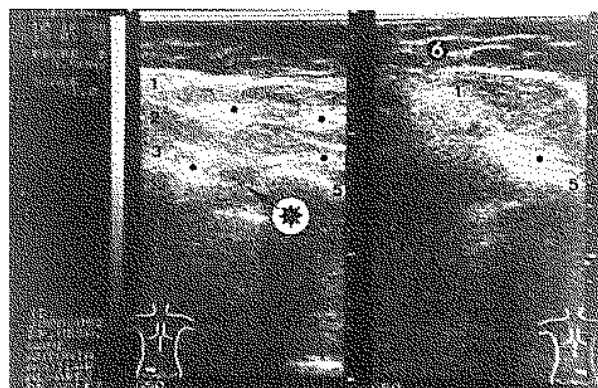
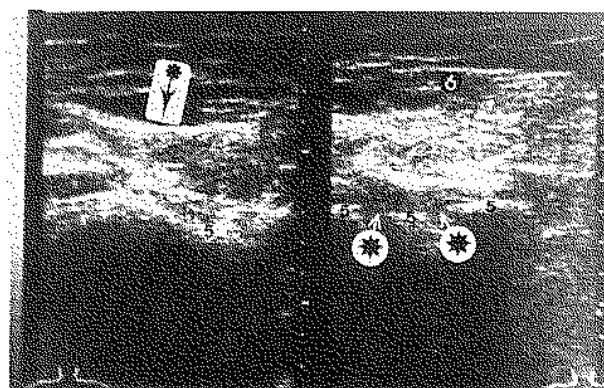


Fig. 5. — The gluteus maximus muscle, the medius and the minimus present images of echogenic condensation (●).



Ref. 1. Gluteus maximus muscle. 2. Gluteus medius muscle. 3. Gluteus minimus muscle. 4. Fascia lata. 5. Osseous outline. 6. Subcutaneous cellular tissue.

Despite the increased echogenicity that appears in the entire area, the identification of the osseous profile is not difficult. Sometimes the image of the iliac bone is interrupted (figs. 5 and 6), giving the appearance of calcifications in the collagen tissue thickness. Botto (1) also found intramuscular calcifications that we have not been able to confirm.

The ultrasonographic variations are typical of a neuromuscular process that we can classify as Heckmatt scale degree II (3), in which myopathic processes are included. The gluteus maximus has certain cytochemical and morphometric modifications, which suggest that this muscular fibrosis is the result of a mixed lesion in which there is a primary muscular modification associated with the patient's pathophysiology. There is a predominance of fibrillar atrophy typical of denervation which results from fibrous constriction of the motor ramus and retrograde reinnervation (5).

### CONCLUSION

We find sonography to be useful in the diagnosis and follow-up of gluteal fibrosis. It is a noninvasive method to quickly identify the existence of a pathological muscular process. In the case of gluteal fibrosis, it delineates the areas of increased fibrosis.

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### REFERENCES

1. Botto F., Portigliatti M., Rossi P., Sibelli P. Studio anatomo-patologico su un caso di fibrosis glutea. *Minerva Ortop.*, 1982, 33, 517-521.
2. Esteban B., Gutierrez R., Martinez R. Fibrosis muscular progresiva. *Rev. Esp. Cir. Ost.*, 1970, 29, 321-340.
3. Heckmatt I. Z., Leeman S., Dubowitz V. Ultrasound imaging in the diagnosis of muscle disease. *J. Pediatr.*, 1982, 101, 656-660.
4. Mesa-Ramos M., Carpintero P., Carpio M., Lopez A. Aspectos citoquímicos y morfométricos de la fibrosis glútea. *Rev. Esp. Cir. Ost.*, 1986, 21, 109-116.
5. Mesa-Ramos M. La fibrosis glútea. *Jims S. A.*, Barcelona, 1990, pp. 122-125.
6. Pipino F., Giorgi G. Fibrose fessière et fibrose des muscles de la cuisse. *Acta Orthop. Belg.*, 1975, 41, 323-332.

### SAMENVATTING

*M. MESA-RAMOS, E. GARCÍA CRIADO, B. MEL-LADO RIDER, F. MESA-RAMOS, P. ALFARO RODRÍGUEZ en P. CARPINTERO BENÍTEZ. Wij-zigingen van het normaal echografisch beeld bij gluteale fibrose.*

In de literatuur wordt er geen melding gemaakt van het gebruik van echografie bij de diagnose van musculaire fibrose. De auteur beschrijft de echografische beelden, gezien bij 40 patiënten met een uitgesproken flexiebeperking van de heup gepaard aan verharding en atrofie van de gluteale spieren door fibreuse proliferatie.

### RÉSUMÉ

*M. MESA-RAMOS, E. GARCÍA CRIADO, B. MEL-LADO RIDER, F. MESA-RAMOS, P. ALFARO RODRÍGUEZ et P. CARPINTERO BENÍTEZ. Modifications de l'image échographique dans la fibrose fessière.*

La littérature ne fait pas mention de l'usage de l'échographie dans le diagnostic de la fibrose musculaire. L'auteur décrit les images échographiques observées chez 40 malades qui présentaient une importante limitation de la flexion de la hanche ainsi qu'un durcissement et une atrophie de la musculature fessière, suite à la prolifération de tissus fibreux.