

Thickened fatty filum terminale: MR imaging

A. Uchino, T. Mori, and M. Ohno

Department of Radiology, Kyushu Rosai Hospital, Fukuoka, Japan

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Summary. MR images of four patients with a thickened filum terminale showing a fat signal are presented. There were no related symptoms and no evidence of tethering. The thickened fatty filum terminale seemed to be a developmental anomaly and without clinical significance. As the incidence of this anomaly was 0.24% in our series, knowledge of its possible presence of this anomaly is important for routine reviews of MR image.

Key words: Filum terminale – Fat tissue – Magnetic resonance imaging

A thickened filum terminale is usually associated with tethered spinal cord syndrome [1–3]. An intradural fat signal in MR imaging is generally indicative of a spinal lipoma [1–4]. We report here four cases of thickened fatty filum terminale, *without* a tethered spinal cord.

Patients and methods

From February 1988 through February 1990. MR images of the lumbar spine of 1,691 Japanese patients were obtained in our hospital. Four patients with a thickened filum terminale with a fat signal were found. There were

three women and one man, the age range being from 17 to 59 years (mean, 43.5 years).

All patients were examined using a 1.5 T Signa (General Electric, Milwaukee, WI) superconducting magnet with a 5 × 11 cm inch surface coil. T1-weighted multiple sagittal images and T2*-weighted midsagittal and multiple axial images were routinely obtained for all patients. T1-weighted images were obtained using spin-echo (SE) pulse sequences with imaging parameters of 400/20/2 (TR/TE/excitations). T2*-weighted images were obtained using gradient-refocused-echo (GRE) pulse sequences with imaging parameters of 13/300/17/4 (flip angle/TR/TE/excitations). The section thickness was 5 mm. The acquisition matrix was 256 × 256. The field of view (FOV) was 32 cm in the sagittal section and 24 cm in the axial section, respectively. To reduce artifacts, the saturation (SAT) technique was used for SE images and the flow compensation (FC) technique was used for GRE images.

Results

The findings are presented in Table 1. The incidence of thickened fatty filum terminale was 0.24% (4/1691) in this series on Japanese patients. There were no related symp-

Table 1. Data on patients with thickened fatty filum terminale

Case no.	Age/sex	Clinical symptoms	MR findings		Level of conus	Associated abnormalities
			Fatty filum terminale Length (location)	Maximum diameter		
1	45/F	Weakness of left leg	45 mm (L2~L3/4)	3 mm	L1/2?	None
2	59/M	Dullness of both legs	65 mm (L1/2~L3/4)	3 mm	L1/2?	Disk degeneration
3	53/F	Lumbago	25 mm (L1~L2)	2 mm	L1	Disk herniation
4	17/F	Lumbago	55 mm (L1/2~L3/4)	3 mm	L1	None

L, lumbar spine

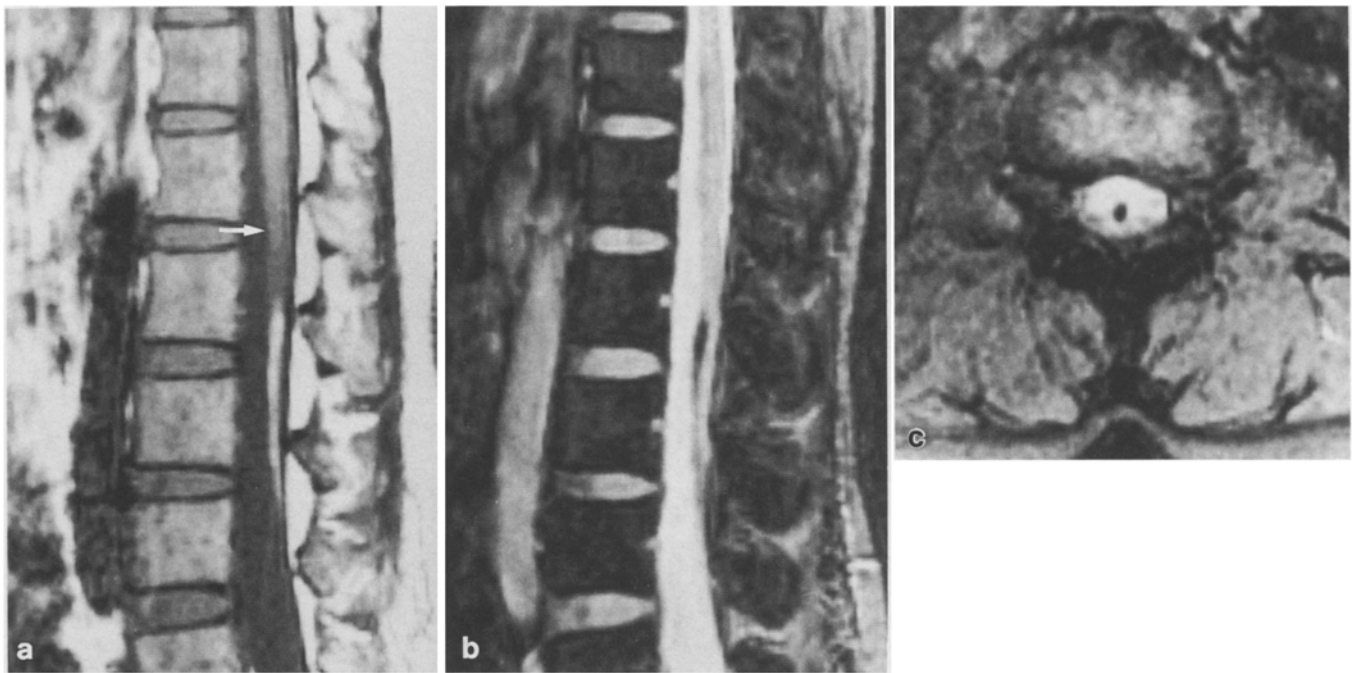


Fig. 1 a-c. Case 1. A 45-year-old woman with a complaint of weakness in the left leg. **a** A linear hyperintense abnormal structure is demonstrated at the level of L2~L3/4 on T1-weighted midsagittal image. The length and the maximum diameter are 45 mm and 3 mm, respectively. No other abnormalities are found. The conus level is

not clearly seen presumably due to partial volume effect, however, it is obvious that there is no tethered spinal cord. We thought that the conus level was L1/2 or more cephalad (*arrow*). **b, c** The lesion is hyperintense on T2*-weighted midsagittal and axial images

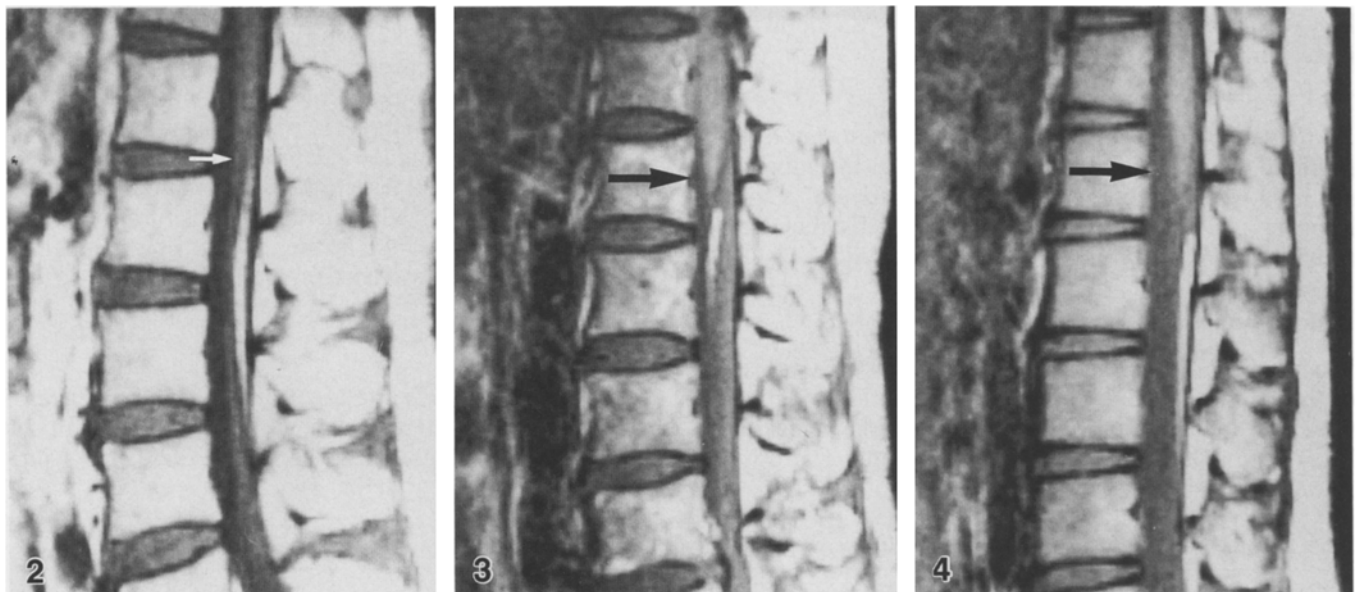


Fig. 2. Case 2. A 59-year-old man with a complaint of dullness in both legs. A linear hyperintense structure and L5/S1 disk degeneration are evident on the T1-weighted midsagittal image. The conus level is obscure, but it seems to be L1/2 or more cephalad (*arrow*)

Fig. 3. Case 3. A 53-year-old woman complaining of lumbago. A small hyperintense structure and L4/5, L5/S1 disk herniations are

evident on T1-weighted midsagittal image. The conus level is L1 (*arrow*)

Fig. 4. Case 4. A 17-year-old girl complaining of lumbago. There is a linear hyperintense structure, but otherwise a normal on T1-weighted midsagittal image. The conus level is L1 (*arrow*)

toms of a thickened fatty filum terminale in these patients. Length of the thickened fatty filum terminale varied from 25 mm to 65 mm (Figs. 1-4), between the level of L1 and L3/4, namely the proximal half of the filum terminale. The maximum diameter varied from 2 mm to 3 mm. In two of

the four patients, the conus level was L1 (Figs. 3, 4). In the remaining two patients, the conus was not clearly demonstrated, presumably due to a partial volume effect. However, it was clear that the conus level was at L1/2 or more cephalad (Figs. 1 a, 2). In two of the four patients, disk dis-

orders were present. There were, however, no associated anomalies such as spinal dysraphism.

Discussion

MR imaging is an useful modality for diagnosing both tethered spinal cord and spinal lipomas [1–4]. Raghavan et al. [2] reported two patients with thickened fatty filum terminale. They stated that this is a possible result of faulty retrogressive differentiation. This anomaly was an incidental finding and may not be an important radiologic indicator of a tethered spinal cord [2]. McLendon, et al. [6] used computed tomography and found that adipose tissue in the filum terminale may indicate a tethering of the spinal cord.

In our hospital, most of the patients examined using MR imaging of the lumbar spine complained of lumbago and/or leg pain and had disk disorders and/or spinal canal stenoses, thus the materials of our study consisted of selected patients. None of our patients had symptoms related to the filum terminale, hence, detection was incidental. In our patient 1, the cause of the weakness in her left leg was not identified. Dullness in both legs in our patient 2 was thought to be caused by L5/S1 disk degeneration. The range of conus levels of our patients between L1 to L1/2 were not indicative of a tethered cord [5].

We have searched in vain for reported descriptions of a thickened fatty filum terminale [7], and, to our knowledge, reference 2 seems to be the only one related.

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Dr. A. Uchino
 Department of Radiology
 Faculty of Medicine
 Kyushu University Hospital
 Maidashi, 3-1-1, Higashi-ku, Fukuoka 812
 Japan