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# Spinal intradural müllerianosis: a case report

**V. Barresi[1,2], S. Cerasoli[2], E. Vitarelli[1] and R. Donati[3]**

[1]Department of Human Pathology, University of Messina, Italy, [2]Unit of Human Pathology, M. Bufalini Hospital, Cesena, Italy and [3]Unit of Neurosurgery, M. Bufalini Hospital, Cesena, Italy

**Summary.** Müllerianosis is a term used to indicate lesions composed of an admixture of two or three types of müllerian-derivation glands in heterotopic sites. In this report we describe a case of spinal cord müllerianosis which occurred in a 42-year-old woman. The patient had suffered from catamenial lumbago and sciatica of three years duration before undergoing laminectomy of L2-L3 with excision of a polypoid mass that compressed nerve trunks.

At histological examination, the lesion was composed of endocervical, endometrial and tubal glands within a smooth muscle nodule. These features were consistent with a diagnosis of müllerianosis.

This is a very uncommon form of presentation of müllerianosis that must be correctly identified since patients can benefit from hormonal therapy.

**Key words:** Müllerianosis, Spinal cord, Endometriosis,

## Introduction

Müllerianosis (Batt et al., 1990) is a term used to indicate lesions composed of an admixture of two or three types of müllerian-derivation glands in heterotopic sites. It mostly has been found in the urinary bladder (Clement and Young, 1992; Nazeer et al., 1996; Young and Clement, 1996; Donnè et al., 1998; Margulis et al., 2001; Clement, 2002), but several reports have documented its presence also in other sites, such as pelvic lymphnodes (Sinkre et al., 2001; Ferguson et al., 1969), ureter (Nogales, 1999), vermiform appendix (Cajigas and Axiotis, 1990) and mesosalpinx (Lim et al., 2003).

We report a case of intradural müllerianosis occurring in the spinal cord. To our best knowledge no other cases in this site have been previously reported.

*Offprint requests to:* Dr.ssa Valeria Barresi, Dipartimento di Patologia Umana, Policlinico Universitario G. Martino, Pad. D, Via Consolare Valeria, 98125 Messina, e-mail: valeriabarresi@hotmail.com

A 42-year–old woman was admitted to M. Bufalini Hospital (Cesena, Italy) with complaints of lumbago, occurring in association with menstruation, of three years' duration. The symptoms had worsened over time, exacerbated by sciatica mostly involving the left lower limb. Neurological examination revealed left Achilles tendon areflexia. Lumbar MRI was performed. It disclosed an intradural mass at L2-L3, resembling schwannoma or ependymoma (Fig. 1). The patient underwent laminectomy of L2-L3. An encapsulated, polypoid, nodule of 1.9 cm, apparently originating from terminal phylum and with the gross morphology of a terminal phylum ependymoma, was totally excised. Post-operative course was uneventful.

## Materials and methods

Surgical specimen was fixed in 4% buffered formalin and embedded in paraffin. Tissue sections of 5 $\mu$m in thickness were stained with routine hematoxylin and eosin (H&E). Immunohistochemistry was carried out against Estrogen Receptor (1:50 diluted; clone 1D5, Dakocytomation, Denmark), Progesteron Receptor (1:50 diluted; clone PGR 636, Dakocytomation, CA, USA), low molecular weight cytokeratins (1:50 diluted; clone 116-NS-19.9, Dakocytomation, CA, USA), Vimentin (1:150 diluted; clone MNF 116, Dakocytomation, CA, USA) and carbohydrate antigen 19.9 (1:50 diluted; clone 116-NS-19.9, Immunotech, Marseille, France). Microwave pre-treatment was employed for each immunoreaction, except for immunohistochemical procedure against vimentin. Briefly, endogenous peroxidase activity was preliminary blocked with 3% H2O2 for 15 min. Sections were successively incubated at 4°C overnight with primary antibodies. The bound primary antibody was visualized by avidin-biotin-peroxidase detection using the Vectastain Rabbit/Mouse Elite Kit, according to the manufacturer's instructions. 3-3' diaminobenzidine (DAB) was used as the chromogen. Sections were finally counterstained with Mayer-haematoxylin and mounted.

## Results

Histological examination by hematoxylin-eosin staining revealed a lesion consisting of smooth muscle with entrapped, small, isolated glands. Some were cystically dilated, contained mucus and were lined by columnar cells (Fig. 2A), thus closely resembling endocervical-type glands; others were lined by cubic, ciliated cells, with histological features of tubal epithelium (Fig. 2B). A few foci of endometriosis were also noted (Fig. 2C). Immunohistochemically, the different epithelial glands were labelled by oestrogen and progesterone receptors (Fig. 2D), co expressed vimentin and low molecular weight cytokeratins and displayed a positive immunostaining for carbohydrate antigen 19.9 thus exhibiting a characteristic müllerian immunohistochemical profile.

Therefore we classified the lesion as "müllerianosis". According to the advice of a gynaecologist and on the basis of histological diagnosis, the patient was subjected to hormonal therapy to obtain a pharmacological castration. RMI, performed six months later, showed normal post-operative images. Total remission of subjective symptomathology has been obtained.

## Discussion

The designation of Müllerianosis is used in such cases in which an admixture of endocervicosis, endosalpingiosis and endometriosis is present.

As previously mentioned, müllerianosis has been described in several sites, but no specific reports exist about its involvement of the central nervous system. Nevertheless, endometriosis occurrence has been documented in nervous structures (Margulis et al., 2001). The most commonly involved site is the sciatic nerve, probably because of its anatomical contiguity to the lower pelvis (Torkelson et al., 1988; Baker et al., 1996; Dhote et al., 1996; Fedele et al., 1999). In this instance, clinical manifestation is that of cyclic sciatica, due to compression to the nerve trunks, with characteristic recurrence at menstruation.

Also our patient complained of catamenial lumbago and sciatica, but differently from these cases, the lesion did not involve sciatic nerve root or trunk, but the spinal cord, having an intradural location, at L2-L3 level. Characteristic symptomatology was, probably, referable to the presence of endometrioid functional (immunohistochemistry demonstrated expression of oestrogen and progesterone receptors) glands within the mass, causing ectopic extravasations of blood during menstruation, with consequent spinal cord compression.

To the best of our knowledge, only a few cases of spinal endometriosis have been published (Lombardo et al., 1968; Thibodeau et al., 1987; Carta et al., 1992; Duke et al., 1995; Sun et al., 2002). The major clinical characteristics of spinal endometriosis are a series of symptoms associated with the menstrual period with meningeal irritation syndromes, cranial hyper-pressure resulting from recurrent subarachnoid haemorrhage, or symptoms deriving from compression of nidus to nerve tissue of the spinal canal (pain in the lumbar region or lower extremities, dysesthesia of the bladder or rectum, and even paraplegia). There can be also manifestations resulting from local infiltration of nidus, lumbar pain or dyskinesia.

The pathogenesis of müllerianosis is still unclear. As for endometriosis, metaplastic and implantation origins have been contemplated (Young and Clement, 1996;

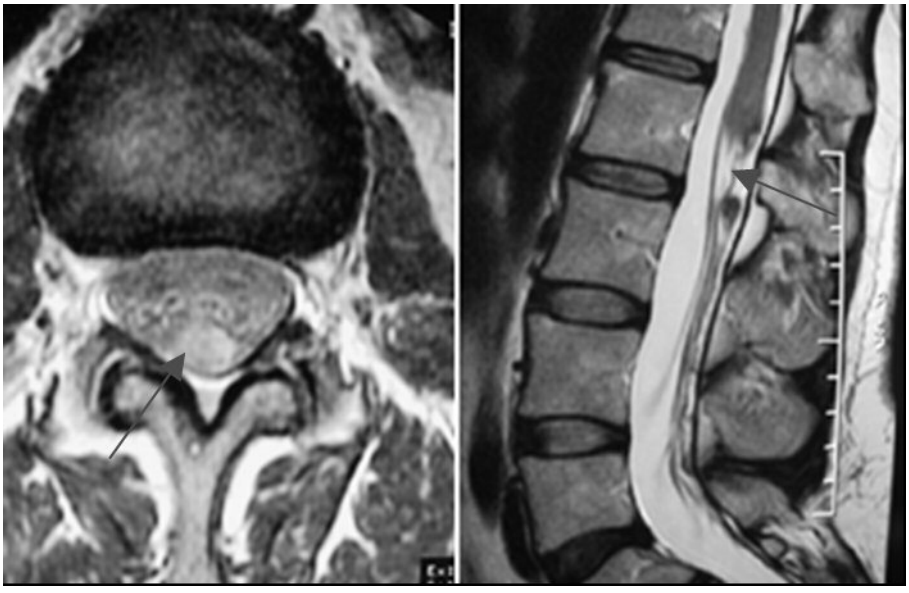

**Fig. 1.** MNR demonstrating a discrete intradural mass at L2-L3.

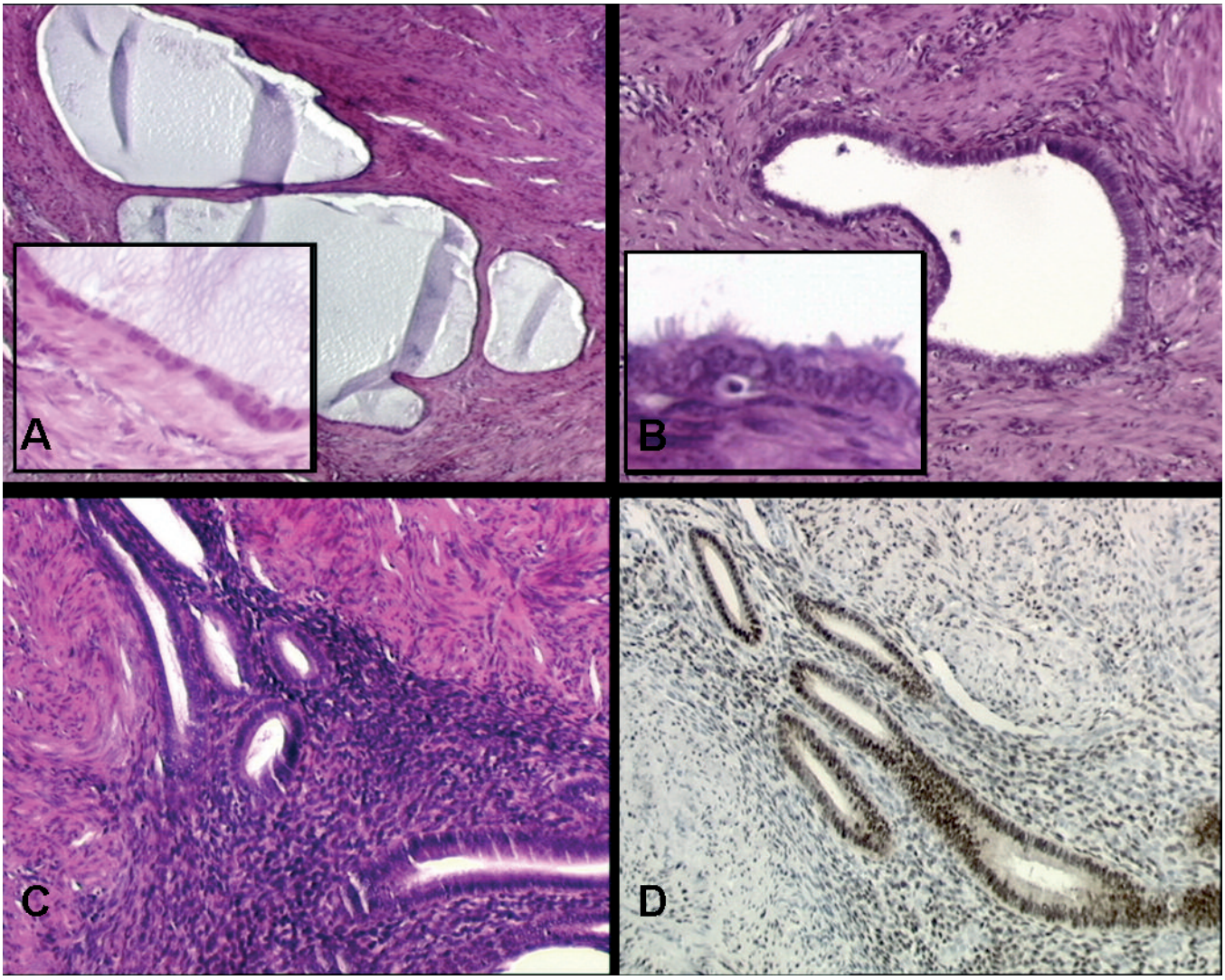


**Fig. 2.A.** Clusters of endometrial glands, typically surrounded by cytogenic stroma were evidenced at histological examination of the mass. (H & E; x 100). **B.** Cystically dilated, containing mucus glands present within the mass. Columnar lining epithelium is shown in inset. (H & E; x 40; inset: H & E; x 200). **C.** Cubic, ciliated epithelium, lined the third histologic type of glands distinguishable in the lesion. (H & E; x 100: H & E; x 200). **D.** Endometrial glands labelled by Oestrogen Receptor Antibody (Oestrogen Receptor stain; x 100)

Donnè et al., 1998) Implantation origin is postulated for such cases associated with previous pelvic surgery.

In our opinion, müllerianosis involving pelvic and lower abdominal structures might have a derivation from the so-called "secondary müllerian system", including pelvic and lower abdominal mesothelium and the subjacent mesenchyme of females.

This layer corresponds to the epithelial mesoderm (coelomic epithelium) covering intraembryonal coeloma that, during embryogenesis, gives rise to the müllerian ducts, whose epithelium then differentiates into endocervical, endometrial and tubal epithelium.

Peritoneal mesothelium might retain its "potential" and thus, under unknown stimuli, it might be able to further differentiate into müllerian structures in the adult.

In our case, displacement of coelomic epithelium and subjacent mesenchyme during embryonic development might give an explanation for müllerianosis occurring in such unusual site.

Smooth muscle tissue accompanying epithelial differentiation within the nidus, and endometrial stroma in endometriosis foci, might have arisen from proliferation of the coelomic mesenchyme in the heterotopic site.

X ray, CT and NMR images can not differentiate spinal müllerianosis. They show a tumoroid occupancy

in the spinal canal, hardly distinguishable from tumours. Microscopic examination, disclosing a benign lesion consisting of smooth muscle with entrapped glands, is necessary for a final diagnosis. The pathologist, at first amazed for a such unexpected finding, can recognize characteristic histologic features, that, together with immunohistochemical procedures, make identification of müllerianosis straightforward.

Though the extreme rarity of this lesion, its correct identification is crucial for management of the patient, that can greatly benefit from hormonal therapy, especially in cases without radical surgery to prevent recurrence.

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