

# ENDOMETRIOSIS: A correlation between high resolution.....

Grammatico.....

**Objective:** To evaluate Gadoline contrast High Definition Nuclear Magnetic Resonance (HDNMR) imaging as an effective noninvasive diagnostic tool in clinical suspected endometriosis.

**Design:** Prospective consecutive research and blind comparison to a gold standard – laparoscopy (LPCY).

**Materials & methods:** Fifty clinically suspected endometriosis patients (15 / 51 years), between 2012 and 2016. High resolution 1.5 T device. Preparation: saline enema, N-butylbromure hyoscine, four hour fasting. Protocol: T1 fat saturation sequences (axial, sagittal), T2 (axial, sagittal, coronal), T1 fat saturation after contrast (axial, sagittal). Detailed lesion mapping. Intravaginal and intrarectal contrast gel.

**Results:** All 50 patients were subjected to laparoscopic surgery after HDNMR. Twenty two, with imaging diagnosis of deep infiltrating endometriosis (DIE) presented such lesions at LPCY: 14 with bowel infiltration, 5 with bladder implants, 1 at rectovaginal septum, 1 retroperitoneal with ureter compromise, and 1 at inguinal level. All 28 patients with imaging diagnosis of superficial endometriosis presented such lesions at LPCY: 14 with bowel infiltration, 5 with bladder implants, 1 at rectovaginal septum, 1 retroperitoneal with ureter compromise, and 1 at inguinal level. All 28 patients with imaging diagnosis of superficial endometriosis presented such lesions at LPCY: 14 with bowel infiltration, 5 with bladder implants, 1 at rectovaginal septum, 1 retroperitoneal with ureter compromise, and 1 at inguinal level. All 28 patients with imaging diagnosis of superficial endometriosis presented such lesions at LPCY: 14 with bowel infiltration, 5 with bladder implants, 1 at rectovaginal septum, 1 retroperitoneal with ureter compromise, and 1 at inguinal level. All 28 patients with imaging diagnosis of superficial endometriosis presented such lesions at LPCY: 14 with bowel infiltration, 5 with bladder implants, 1 at rectovaginal septum, 1 retroperitoneal with ureter compromise, and 1 at inguinal level.

**Conclusions:** Multiplanar resolution of HDNMR as a first line imaging diagnostic tool in endometriosis allows to have a precise location of the possible lesions to be removed.

**Key Words:** endometriosis, MRI, laparoscopy

## BACKGROUND

## OBJECTIVE

## MRI PROTOCOL

## MRI IMAGING FINDINGS

### SUPERFICIAL ENDOMETRIOSIS

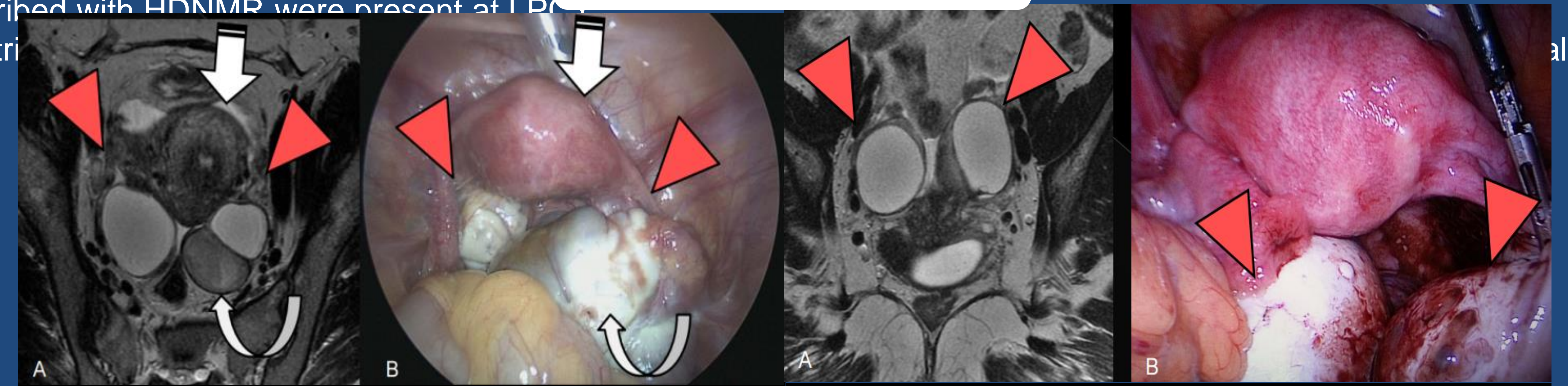


Fig 1. (A) Axial MRI (B) intraoperative image shows enlarged ovaries (red arrow), with endometriomas (curved arrow) T1 FS homogeneous hyperintense.

Fig 2. (A) MRI Coronal (B) intraoperative demonstrates ovaries (red arrow) in middle line showing posterior retraction caused by peritoneal adhesions with endometriomas

### DEEP ENDOMETRIOSIS

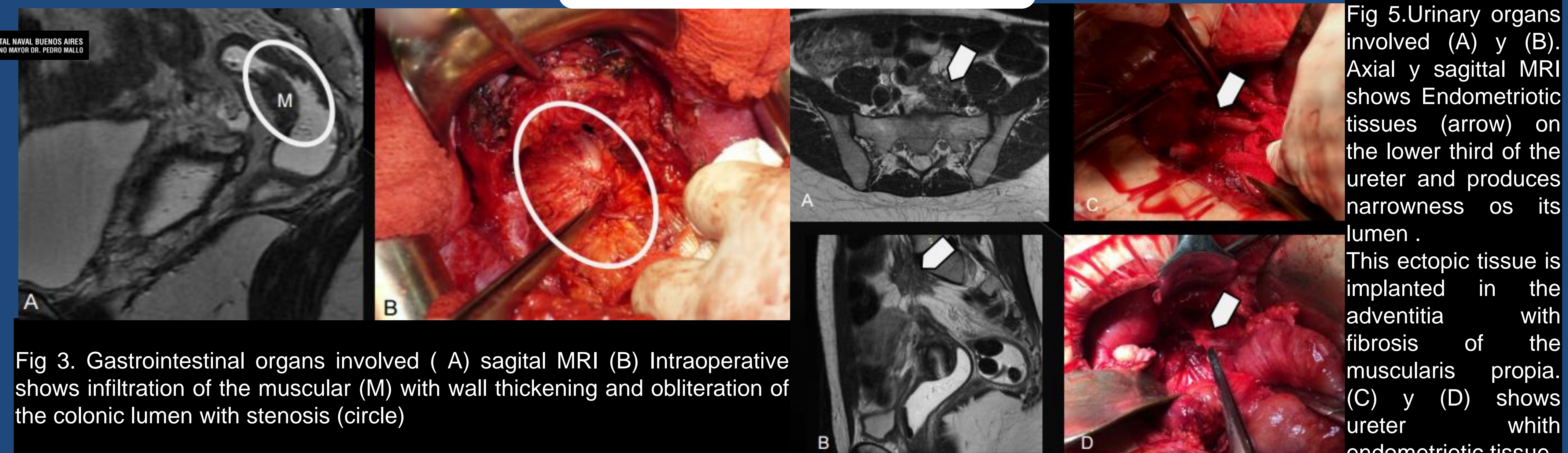


Fig 3. Gastrointestinal organs involved ( A) sagittal MRI (B) Intraoperative shows infiltration of the muscular (M) with wall thickening and obliteration of the colonic lumen with stenosis (circle)

Fig 5. Urinary organs involved (A) y (B). Axial y sagittal MRI shows Endometriotic tissues (arrow) on the lower third of the ureter and produces narrowness of its lumen. This ectopic tissue is implanted in the adventitia with fibrosis of the muscularis propia. (C) y (D) shows ureter which endometriotic tissue.

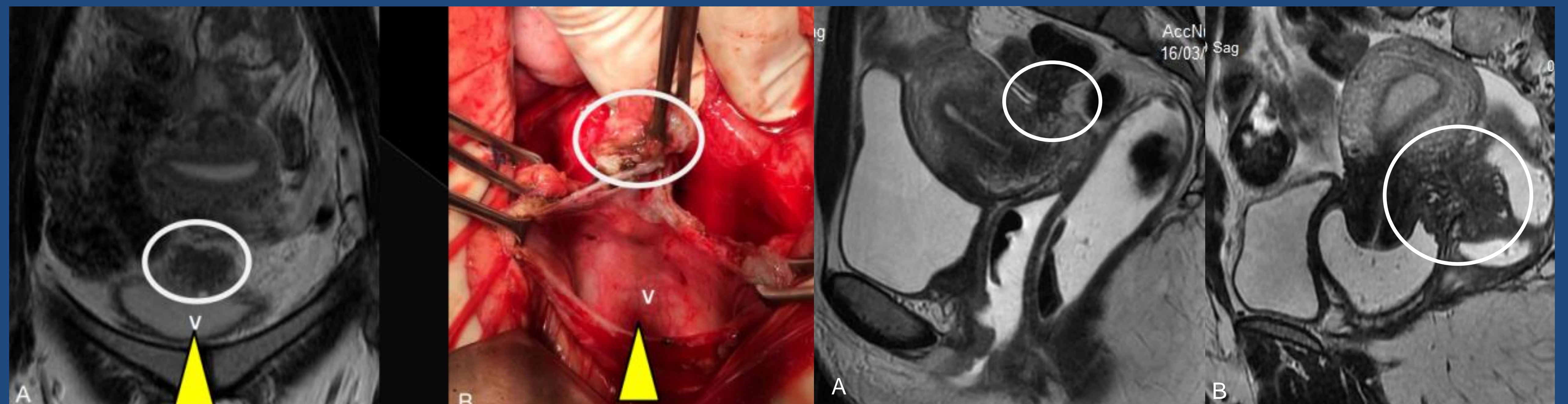


Fig 4. Urinary organs involved (A) Coronal MRI y (B) Intraoperative shows lesion (circle) on the top of the bladder

Fig 6. A y B Sagittal MRI shows deep infiltrating endometriosis in the posterior cul de sac which is elevated



El título con que fue enviado el abstract y que debe figurar  
Tal cual

**Endometriosis: A Correlation between  
High Resolution Nuclear Magnétic  
Resonance and Laparoscopic findings**  
**Objective**

Nicholson R E Grammatico D, Gonzalez A,, Rolla E D  
Soc. Arg. De Endometriosis Argus Diagnóstico, Htal. Naval de Bs. As., San Isidro Medicina,

## Texto a publicar debajo de los autores

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- **Results:** All 50 patients were subjected to laparoscopic surgery after HDNMR. Twenty two, with imaging diagnosis of deep infiltrating endometriosis (DIE) presented such lesions at LPCY: 14 with bowel infiltration, 5 with bladder implants, 1 at rectovaginal septum, 1 retroperitoneal with ureter compromise, and 1 at inguinal level. All 28 patients with imaging diagnosis of ovarian and/or peritoneal superficial lesions proved positive for the disease: 4 had small implants of less than 5 mm, and the rest, endometriomas of different sizes. To note: all images described with HDNMR were present at LPCY.
- **Conclusions:** Multiplanar resolution of HDNMR recommends it as a first line imaging diagnostic tool in endometriosis, specially when DIE is suspected. It is a valuable approach in pre-surgical strategic planning since it allows to have a precise location of the possible lesions to be removed.
- **Key Words:** endometriosis, MRI, laparoscopy



# Background

Endometriosis has a Golden estándar for its diagnosis: Laparoscopy and histologic confirmation in biopsy specimens. High resolution contrast MRI will not replace this 100% reliable procedure, but should be a valuable aid in the clinical management of dysmenorrhea and chronic pelvic pain, as well as a profitable preoperative tool that can guide the surgeon to better use of laparoscopy.

## Our current goal

To demonstrate how the use of MRI within a multidisciplinary close contact team integrated by an imaging specialist and three laparoscopic surgeons has benefited their patients allowing for a better preoperative planning of surgeries thanks to the almost exact correlation between imaging and laparoscopic findings.

## Mri protocol

Pelvic MR imaging is performed by using a 1.5 T. GE Signa HDXT device. Preparation: saline enema, N- butylbromure hyoscine, four hour fasting. Sequencies: T2 axial, coronal, sagital. T1 FS axial y sagital, with intravaginal and intrarrectal contrast gel



## Mri findings

MRI gives exact details of the location and anatomical relations of the lesions particularly. It allows the formulation of an adequate surgical strategy.

MRI Visualizes blind spots such as: nerve system and ligament compromisos.

MRI reveals fibroid tracts between organs (adhesions), small implants., endometriomas and uterine adenomyosis.

MRI is specially useful in the diagnosis of Deep Infiltrating Endometriosis, Such as rectosigmoideal disease, bladder infiltration and ureteral locations.

## SUPERFICIAL ENDOMETRIOSIS IMAGING FINDINGS

Small implants are visualized as spontaneous hiperintense images in T1 sequence.  
Adhesions lineal hipointense bands in T2 sequence.

## DEEP ENDOMETRIOSIS IMAGING FINDINGS (direct and indirect visual aids)

Endometriomas: Enlarged ovaries with hematic content are seen as hiperintense **images in T1 sequence and they appear with a shading effect in T2 sequence.**

Rectosigmoideal : Posterior displacement of the uterus  
Medialization of the ovarian (kissing sign)  
Bowel angulations  
Elevation of the posterior vaginal fornix  
Infiltrating nodules at the rectovaginal septum  
Infiltrating nodules at the sigmoideal bowel wall

Adnexial: Hematosalpinx (**spontaneous hiperintensity in T1**)

**Uterine: Adenomyosis uterine enlargement and JZ widening**

Ureteral: Periureteral nodules, ureteral dilatation, ureteral stops, hydronephrosis