

**Materials and Methods:** The records of 134 consecutive patients who underwent laparoscopy for refractory anogenital pain were retrospectively reviewed. All neurosurgical procedures, such as neurolysis/decompression of the pudendal nerve and the sacral nerve roots or neuroelectrode implantation to the sacral plexus for postoperative neuromodulation, were done via the laparoscopic transperitoneal approach to the pelvic nerves. **Results:** A total of 18 patients had Alcock's canal syndrome and decompression was successful in 15. Due to failed decompression 3 patients underwent secondary sacral laparoscopic neuroprosthesis implantation with a decrease of at least 50% on the pain visual analog scale. Sacral plexus lesions or radiculopathies, most commonly postoperative lesions and retroperitoneal endometriosis, were found in 109 patients who underwent laparoscopic neurolysis of the sacral plexus. The final outcome depended on the etiology. Of patients with postoperative nerve damage 62% had a decrease in the mean +/- SD preoperative visual analog scale score of from 8.9 +/- 2.9 (range 7 to 10) to 2.4 +/- 2.3 points (range 0 to 4) at the time of article submission at a mean followup of 17 months (range 3 to 39). Because of failed decompression, 8 patients underwent secondary sacral laparoscopic neuroprosthesis implantation and a decrease in the pain visual analog scale score was achieved in 5. Of patients with an endometriosis lesion of the sacral plexus 78% had a decrease in the mean preoperative visual analog scale score of 8.7 +/- 1.9 (range 8 to 10) to 1.1 +/- 0.7 points (range 0 to 2) at the time of article submission at a mean followup of 21 months (range 2 to 42). All 6 patients with vascular entrapment of pelvic nerves achieved complete relief. The last 7 patients underwent primary sacral laparoscopic neuroprosthesis implantation with at least a 50% decrease in the pain visual analog scale score in 4. **Conclusions:** Our findings emphasize that in patients with seemingly inexplicable anogenital pain, especially after failed treatment for Alcock's canal syndrome, laparoscopic exploration of the pelvic nerves must be done for further diagnosis and therapy before prematurely labeling the patients as refractory to treatment.

### Editorial Comment

Laparoscopic minimally invasive approach has been applied in Urology for benign, oncological diseases, reconstructive surgery; but this novel approach to manage endopelvic etiologies of pudendal pain is a pioneer approach to a complex urogynecological problem.

The author describe a protocol that when followed seemed to successfully deal with the complex pelvic pain disease.

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## IMAGING

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### **Renal cell carcinoma: dynamic contrast-enhanced MR imaging for differentiation of tumor subtypes--correlation with pathologic findings**

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**Purpose:** To retrospectively evaluate whether the enhancement patterns of pathologically proved clear cell, papillary, and chromophobe renal cell carcinomas (RCCs) measured on clinical dynamic contrast agent-enhanced magnetic resonance (MR) images permit accurate diagnosis of RCC subtype.

**Materials and Methods:** This study was Institutional Review Board approved and HIPAA compliant; informed consent was waived. One hundred twelve patients (76 men, 36 women; age range, 25-88 years; mean age, 58.1 years) underwent MR imaging of 113 renal masses (mean diameter, 5.4 cm) with pathologic diagnoses of clear cell (n = 75), papillary (n = 28), or chromophobe (n = 10) RCC. A 1.5-T clinical MR protocol was used before and after (corticomedullary and nephrographic phases) intravenous administration of contrast agent. Region-of-interest measurements within tumor and uninvolved renal cortex were used to calculate percentage signal intensity change and tumor-to-cortex enhancement index. Subtype groups were compared by using linear mixed-effects models. Receiver operating characteristic (ROC) curve analysis was performed for the comparison of clear cell and papillary RCCs.

**Results:** On both the corticomedullary and nephrographic phase images, clear cell RCCs showed greater signal intensity change (205.6% and 247.1%, respectively) than did papillary RCCs (32.1% and 96.6%, respectively) ( $P < .001$ ). Chromophobe RCCs showed intermediate change (109.9% and 192.5%, respectively). The tumor-to-cortex enhancement indexes at corticomedullary and nephrographic phases were largest for clear cell RCCs (1.4 and 1.2, respectively), smallest for papillary RCCs (0.2 and 0.4, respectively), and intermediate for chromophobe RCCs (0.6 and 0.8, respectively). Signal intensity changes on corticomedullary phase images were the most effective parameter for distinguishing clear cell and papillary RCC (area under ROC curve, 0.99); a threshold value of 84% permitted distinction with 93% sensitivity and 96% specificity.

**Conclusion:** Clear cell, papillary, and chromophobe RCCs demonstrate different patterns of enhancement on two-time point clinical dynamic contrast-enhanced MR images, allowing their differentiation with high sensitivity and specificity.

### Editorial Comment

Each subtype of RCC is associated with a different prognosis and tumor behavior. If possible, preoperative characterization of RCC subtypes would influence the degree of preoperative evaluation and the determination of the appropriate extent of surgery (1-3). For example a patient with a subtype that tends to not metastasize or recur, such as the chromophobe, may not need to undergo a complex metastasis survey and unnecessarily wide resection may be avoided, thereby, decreasing postoperative morbidity and mortality (3). For this reason, adequate preoperative characterization of the RCC subtype has been attempted utilizing contrast enhanced CT studies (2,3). On multiphase contrast enhanced the clear cell (70.3%) and papillary (69.2%) subtypes tended to show heterogeneous or predominantly peripheral enhancement, whereas the chromophobe subtype (75%) usually showed homogeneous enhancement.

The authors of this excellent original study found in a study of 112 patients that clear cell, papillary, and chromophobe renal cell carcinoma demonstrated different enhancement patterns when assessed with 3D T1-weighted spoiled gradient-echo sequences before and after (corticomedullary and nephrographic phases) contrast material administration. It is interesting to note that differently from contrast enhanced CT studies, the best results of this dynamic contrast enhanced MR technique was accomplished using analysis of signal intensity in the corticomedullary phase.

As the author mentioned in the text, if their results are confirmed with a larger prospective study, this method would provide equivalent accuracy to that reported for percutaneous biopsy. Probably both techniques will be used together in the preoperative evaluation of renal mass since percutaneous biopsy is the only technique that provides Fuhrman grade immunohistochemical stain.

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### **Correlation of MR imaging and MR spectroscopic imaging findings with Ki-67, phospho-Akt, and androgen receptor expression in prostate cancer**

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**Purpose:** To retrospectively assess whether magnetic resonance (MR) imaging and MR spectroscopic imaging and selected molecular markers correlate with each other and with clinically insignificant and significant prostate cancer (PCa), as defined at surgical pathologic analysis.

**Materials and Methods:** The institutional review board approved this HIPAA-compliant study and waived informed consent. Eighty-nine men (mean age, 63 years; range, 46-79 years) with biopsy-proved PCa underwent combined endorectal MR imaging and MR spectroscopic imaging before radical prostatectomy. Suspicion of clinically insignificant PCa was retrospectively and separately recorded for MR imaging and combined MR imaging and MR spectroscopic imaging by using a scale of 0-3. Clinically insignificant PCa was pathologically defined as organ-confined cancer of 0.5 cm(3) or less without poorly differentiated elements. Prostatectomy specimens underwent immunohistochemical analysis for three molecular markers: Ki-67, phospho-Akt (pAkt), and androgen receptor (AR). To examine differences in marker levels for clinically insignificant and significant cancer, a Wilcoxon rank sum test was used. To examine correlations between marker levels and MR imaging or combined MR imaging and MR spectroscopic imaging scores, the Spearman correlation was used.

**Results:** Twenty-one (24%) patients had clinically insignificant and 68 (76%) had clinically significant PCa at surgical pathologic review. All markers were significantly correlated with MR imaging and combined MR imaging and MR spectroscopic imaging findings (all correlation coefficients > 0.5). In differentiating clinically insignificant from clinically significant PCa, areas under the receiver operating characteristic curves for Ki-67, AR, pAkt, MR imaging, and combined MR imaging and MR spectroscopic imaging were 0.75, 0.78, 0.80, 0.85, and 0.91, respectively.

**Conclusion:** The use of pretreatment MR imaging or combined MR imaging and MR spectroscopic imaging and molecular marker analyses of biopsy samples could facilitate better treatment selection. Supplemental material: <http://radiology.rsna.org/cgi/content/full/250/3/803/DC1>.

### **Editorial Comment**

Insignificant prostate cancer is defined as cancer found on biopsy (T1c), with PSAD < 0.15 ng/mL, Gleason score 6 or lower, or no more than 2 cores with cancer or greater than 50% involvement of any core. As we know insignificant prostate cancer is better defined as low-volume, low-grade tumor since around 10 % of this lesions may present with extra-prostatic extension on radical prostatectomy (1). In this very interesting

manuscript, the authors reported a frequency of 24% of patients with clinically insignificant prostate cancer at radical prostatectomy. Although with some controversy (2), the same group of authors has been shown recently that a nomogram that incorporates MRI and MRSI was more accurate than clinical nomograms (clinical stage, PSA level, biopsy data) in order to predict clinically insignificant prostate cancer (3).

In a study of 89 men with biopsy-proven prostate cancer, the authors demonstrated that combined MRI and MRSI findings and three specific biologic markers that are important in proliferation, apoptosis, and cell survival (Ki-67, phospho-Akt, and androgen receptor AR values) correlated with each other and with clinically insignificant and significant prostate cancer defined at pathologic examination of prostatectomy specimens.

We agree with the authors that if a prospective study confirms their results it may represent the beginning of a new era. An era of integration of pretreatment conventional and functional MR imaging of the prostate with histopathological and specific biologic markers analyses of biopsy specimens. In the near future, this integration probably will allow better treatment selection and thus better outcome for patients with prostate cancer.

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## **PATHOLOGY**

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### **TMPRSS2-ERG gene fusions in “minimal” prostatic adenocarcinoma**

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Background: Minimal or “insignificant” prostatic adenocarcinoma (MinPCa) is defined as tumors with insufficient virulence to threaten survival. Given recent suggestion of TMPRSS2-ERG gene fusion association with aggressive PCa phenotype, we aimed to evaluate incidence of TMPRSS2-ERG fusion in MinPCa in comparison with grade matched “non-minimal” size PCa.

Design: All 33 prostatectomies classified as containing MinPCa (2002-2003) were retrieved. Diagnosis of MinPCa (Gleason Score 6 PCa with total tumor volume < 0.5 CC, single section) was confirmed by a urologic pathologist. Tissue microarray (TMA) was constructed from the 33 cases where each tumor and paired benign tissue was represented by up to triplicate, 1mm, spots. TMA sections of 59 additional archival PCa were used as controls (26 pT2 non-minimal in size, 31 pT3a and 2 pT3b). FISH analysis was performed using break-apart probes for 5' and 3' regions of ERG. Each spot was scored for presence of TMPRSS2-ERG fusion through