

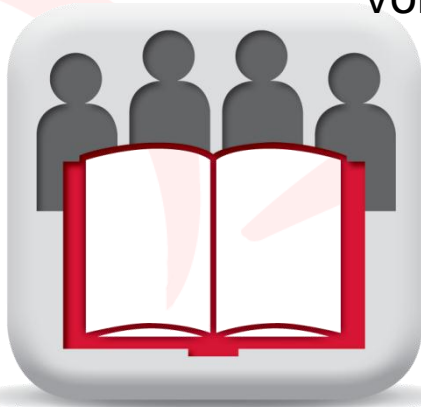
UOG Journal Club: April 2015

Agreement of two-dimensional and three-dimensional transvaginal ultrasound with magnetic resonance imaging in assessment of parametrial infiltration in cervical cancer

二维和三维阴道超声与磁共振成像在宫颈癌宫旁浸润评估的一致性

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Background

背景

- Cervical cancer is the third most common cancer in women worldwide
- 宫颈癌世界上排第三位的常见的女性恶性肿瘤。
- FIGO staging is based mainly on clinical findings at gynecological examination, which often shows discrepancies with surgical findings
- FIGO的分期在临床上主要依据妇科检查，往往与手术结果有差异
- The use of imaging techniques to assess local extent of the tumor invasion, amongst other things, is encouraged
- 建议利用成像技术来评估肿瘤的局部浸润范围
- MRI remains the gold standard test for assessing local extent and invasion
- MRI仍然是目前评估宫颈癌局部范围和侵袭的金标准

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Objective

目标

To compare both 2D and 3D transvaginal ultrasound, with MRI as the gold standard, in assessment of parametrial infiltration of cervical cancer and to determine if all parts of the cervix are equally assessable with ultrasound

以MRI为金标准，比较分析二维和三维超声检查在评估宫颈癌宫旁浸润并确定宫颈所有部分都可以通过超声平等地进行评估

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Patients and Methods

病例与方法

- Prospective observational study between July 2010 and January 2012
2010年7月和2012年1月之间的前瞻性观察研究
- 29 consecutive women with histologically-confirmed cervical cancer undergoing pre-operative work-up in the week before commencing treatment
连续29名组织学上确诊宫颈癌的女性在手术前一周接受术前检查
- All patients underwent MRI and (2D and 3D) transvaginal ultrasound assessment of the cervix in order to assess parametrial infiltration
所有患者均接受MRI和（2D和3D）宫颈阴道超声检查，以评估宫旁浸润
- All patients were subsequently classified according to FIGO criteria after vaginal and rectal examination under anesthesia, speculum examination and chest radiography
所有患者在麻醉下行经阴道和直肠检查，窥器检查和胸部X线检查后，根据FIGO标准进行分类

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Patients and Methods

病例与方法

- For the purposes of the study, the cervix was divided into 18 sectors
- 在这项中，把宫颈分为18个扇区
- Agreement was assessed overall and between each individual sector
- 评估整体和各个扇区之间一致性
- Agreement was assessed using kappa analysis
- 卡方检验评价一致性
- Parametrial infiltration was graded 1–4
- 宫旁浸润分为1-4级
- 3D power Doppler was used to differentiate blood vessels and spiculae of tumor in difficult cases
- 3D能量多普勒被用来区分疑难肿瘤病例的血管和毛刺

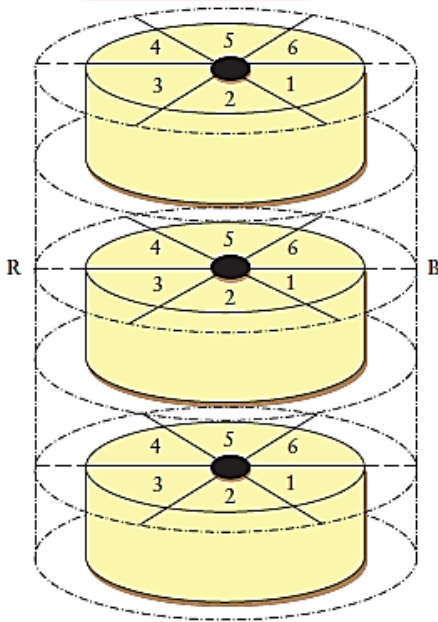


Figure 6 Schematic drawing illustrating the 18 sectors of the cervix (yellow) and the surrounding parametrium (delineated by dotted lines) evaluated with regard to parametrial infiltration. For each of the three cylinders, the following sectors were identified: ventral left (1), lateral left (2), dorsal left (3), dorsal right (4), lateral right (5) and ventral right (6). B, bladder; R, rectum.

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Results

Characteristics of cervical cancers included in the study
本例研究中宫颈癌的特征

Variable	Cervical cancers (n = 29)
FIGO stage	
IB1	2 (7)
IB2	1 (3)
IIA	7 (24)
IIB	13 (45)
IIIB	2 (7)
IVB	4 (14)
Histological type	
Squamous cell carcinoma	24 (83)
Adenocarcinoma	4 (14)
Adenosquamous carcinoma	1 (3)
Degree of differentiation	
1 (well differentiated)	1 (3)
2 (moderately differentiated)	15 (52)
3 (poorly differentiated or undifferentiated)	13 (45)
Tumor type at clinical examination	
Exophytic	15 (52)
Endophytic or ulcerative	14 (48)
Tumor size at clinical examination	
Tumor maximum diameter < 4 cm	11 (38)
Tumor maximum diameter ≥ 4 cm	18 (62)

Ultrasound and MRI characteristics of the cervical tumors included in the study

本研究中宫颈肿瘤的超声和MRI特点

Variable	2D ultrasound	3D ultrasound	MRI
Maximum tumor diameter			
< 4 cm	6 (21)	6 (21)	8 (28)
≥ 4 cm	23 (79)	23 (79)	21 (72)
Parametrial infiltration			
Present	21 (72)	24 (83)	18 (62)
Absent	8 (28)	5 (17)	11 (38)
Maximum degree of parametrial infiltration			
No infiltration	8 (28)	5 (17)	11 (38)
Grade 1	NE	7 (24)	3 (10)
Grade 2	NE	11 (38)	9 (32)
Grade 3	NE	6 (21)	3 (10)
Grade 4	NE	0 (0)	3 (10)

Data are given as n (%). MRI, magnetic resonance imaging; NE, not evaluated; 2D, two-dimensional; 3D, three-dimensional.

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Results

结论

Location of infiltration	Kappa	Agreement (% (n))	Sensitivity (% (95% CI) (n))	Specificity (% (95% CI) (n))
Any infiltration*	0.459	76 (22/29)	89 (70.6–96.9) (16/18)	55 (35.4–72.5) (6/11)
Ventral parametrium	0.720	90 (26/29)	100 (85.4–100) (4/4)	88 (69.5–96.5) (22/25)
Right lateral parametrium	0.494	72 (21/29)	80 (60.5–91.7) (12/15)	64 (44.5–80.4) (9/14)
Left lateral parametrium	0.412	69 (20/29)	75 (55.2–88.4) (3/4)	68 (48.1–83.3) (17/25)
Dorsal parametrium	0.017	58.6 (17/29)	60 (40.4–77.0) (3/5)	58 (38.9–75.7) (14/24)

*Without taking location into account.

Agreement between 2D ultrasound and MRI with regard to parametrial infiltration and sensitivity and specificity of 2D ultrasound with regard to parametrial infiltration using MRI as gold standard

以MRI为金标准，评估二维超声在评估宫旁浸润的特异性和灵敏度的一致性

卡方检验	说明
< 0.20	Poor agreement 不一致
0.21–0.40	Fair agreement 一致性差
0.41–0.60	Moderate agreement 中度一致
0.61–0.80	Good agreement 较一致
> 0.81	Very good agreement 高度一致

Agreement of two-dimensional and three-dimensional transvaginal ultrasound with magnetic resonance imaging in assessment of parametrial infiltration in cervical cancer

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Results

结论

Agreement between 3D ultrasound and MRI with regard to parametrial infiltration and sensitivity and specificity of 3D ultrasound with regard to parametrial infiltration using MRI as gold standard
以MRI为金标准，评估3D超声和MRI在评估宫旁浸润的灵敏度和特异性的一致性

Location of infiltration	3D ultrasound vs MRI with Grade 1 considered as infiltration				3D ultrasound vs MRI with Grade 1 considered as no infiltration			
	Kappa	Agreement (% (n))	Sensitivity (% (95% CI) (n))	Specificity (% (95% CI) (n))	Kappa	Agreement (% (n))	Sensitivity (% (95% CI) (n))	Specificity (% (95% CI) (n))
Any infiltration*	0.508	79 (23/29)	100 (85.4–100) (18/18)	45.5 (27.5–64.6) (5/11)	0.792	90 (26/29)	87.5 (68.9–96.2) (14/16)	92.3 (74.8–98.5) (12/13)
Ventral parametrium	0.176	62.5 (15/24)†	100 (82.8–100) (3/3)	57.1 (35.9–76.3) (12/21)	0.600	87.5 (21/24)†	100 (82.8–100) (3/3)	85.7 (64.5–95.8) (18/21)
Right lateral parametrium	0.595	81 (22/27)†	100 (84.5–100) (15/15)	58.3 (38.2–76.2) (7/12)	0.565	78 (21/27)†	91.7 (73.1–98.3) (11/12)	66.7 (46.0–82.8) (10/15)
Left lateral parametrium	0.326	70 (19/27)†	75.0 (54.4–88.8) (6/8)	68.4 (47.7–84.1) (13/19)	0.467	78 (21/27)†	62.5 (42.0–79.6) (5/8)	84.2 (64.3–94.6) (16/19)
Dorsal parametrium	0.132	52 (15/29)	80.0 (60.5–91.7) (4/5)	45.8 (27.8–64.9) (11/24)	0.583	86 (25/29)	80.0 (60.5–91.7) (4/5)	87.5 (68.9–96.2) (21/24)

*Without taking location into account. †Some patients missing because image quality of these sectors of the 3D volume was suboptimal.

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结 论

3D超声和MRI

- 三维超声检查和磁共振成像方面之间在评估宫旁浸润中度一致（卡方，**0.508**），但三维超声检测可发现早期浸润，而磁共振成像不能。如果早期浸润归类于无浸润，一致性就好多了（卡方，**0.792**）
- **3D超声和MRI**之间的一致性最大的是子宫颈中间部分（卡方，**0.438**），而一致性最低的是宫颈尾部（卡方，**0.125**）

2D超声和MRI

- 二维超声和MRI关于宫旁浸润中度一致（卡方，**0.459**）

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Strengths 展望

- Novel prospective study with standardized research protocol for both MRI and ultrasound, ensuring that both were making comparable assessments
- 最新的前瞻性研究与规范建议，同时使用MRI和超声，以确保双方都做出相当的评估
- Interobserver variability was reduced by all ultrasound scans being performed by a single experienced operator and all 3D offline analysis being performed by a single (different) experienced operator. MRI images were analyzed by two experienced radiologists together
- 所有超声检查由单个有经验的操作人员进行并且另一个有经验的操作人员分析所有三维离线数据以减少观察者之间的差异。MRI图像由两位有经验的放射科学家一起分析。
- Theoretical subdivision of cervix allowed more comprehensive comparison of MRI and ultrasound
- 子宫颈的细分理论，使得MRI和超声检查比较更全面

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Limitation 局限

- 作为初步研究，病例数很小（N =29）
- 研究人群中没有FIGO分期1A期病例
- 由于少数妇女接受手术，他们无法用组织学作为金标准对超声波和MRI评估进行判断。
- 发现一部分患者当评估宫颈尾部是发生转移时，经阴道检查引起伪影

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讨论要点

- 研究的设想是对于接受初次手术患者术前超声波和MRI检查评估宫旁浸润，并以组织学作为金标准。在初次手术的病人中宫旁浸润率低是否意味着这项研究太不切实际？
- 利用二维和三维超声检测宫旁浸润需要多少培训
- 在二维和三维超声评估宫颈癌患者的宫旁浸润，什么是观察者之间和观察者内部的可重复性
- 如何进行宫颈癌早期浸润的临床管理