



Introdution/Background

Gastric cancer: fourth commonest neoplasm worldwide; second most common cause cancer-related deaths. Recent advances of MRI in abdominal diseases: faster imaging (parallel technology), higher spacial resolution and better contrast resolution (vs MDCT). Perspective of funcional evaluation with Diffusion-Weighted Imaging (DWI). Promising results of MRI were presented in gastric cancer literature (Arocena 2006, Anzidei 2009, Wang 2000, Kim 2000). 1.5 T MRI installed at our institution (CHLC-Lisboa) in January 2008 (MDCT only available in March 2009). Arocena M. et al (2006), Rev Esp Enf Dig, 98: 582-590. Ansidei M et al (2009), Radiol Med, 114: 1065-79. Kim A. et al (2000), J Comput Assist Tomogr., 24(3):389-94. Wang C et al (2000), J Comput Assist Tomogr., 24(6): 872-77.

Purpose of the study

Main: to analyse the accuracy of a dedicated MRI protocol for T and N staging of gastric cancer, based on NCCN (6th edition). Acessory: to evaluate the usefulness of each sequence for the staging process. Protocol: hydro-MRI (ingestion of 750 cc of water and 5 gr of effervescent crystals 5 minutes before the start) with iv or im administration of spasmolytic (20 mg of Butylscopolamin N-bromyde, Buscopan/ Boehringer-Ingelheim).

Sequences	TR	TE(ms)	SL.-Th.(mm)	FOV(cm)	Matrix
Ax. T1-GRE	100-250 ms	2.4-4.9	6	30x38	330-512
Ax. T2-TSE/FS (Blade)	2.5-5.0 s	90	6	30x38	256-380
Cor.Haste Cor.True-Fisp Optional: Ax. T2-TSE HR	1000ms 4.6 ms	90 2.3	5 5	30x38 35x35	240-320 240x320
Ax.DWI EPI	3-5 s	80	6	30x38	120-292
Ax.T1GRE-3Dp/G	4.4 ms	2.6	2.5 (20%)	25-40	144-320

Pathological T and N staging (NCCN 6th Ed.)

T1: tumour invasion of lamina propria or submucosa. T2: invasion of muscularis propria or subserosa. T3: penetrates serosa (visceral peritoneum). T4: invades adjacent structures N1: one to six regional positive lymph nodes. N2: seven to fifteen positive regional lymph nodes. N3: more than fifteen regional lymph nodes. Nodes behind Portal Vein or Pancreatic Head, along Superior Mesenteric or Middle Colic Vessels or around abdominal aorta are considered by the AJCC as M1 disease.

Results: N-Staging (33 pts, 34 lesions)

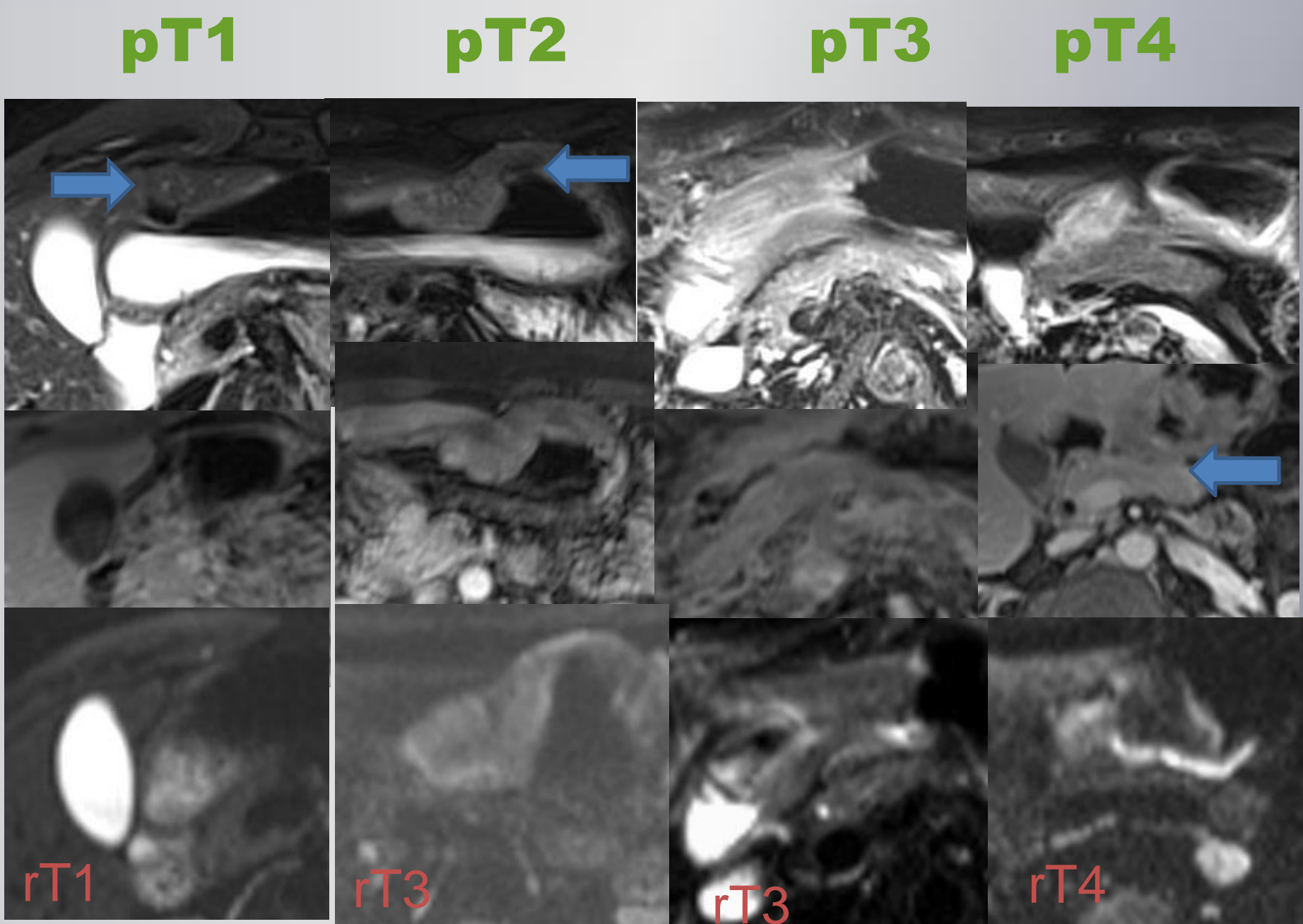
Pathological Staging

%	Sens.	Spec.	Accu.
<u>N0</u>	75	66,6	90,9
<u>N1</u>	88,2	87,5	87,9
<u>N2</u>	80	82,1	81,8
<u>N3</u>	0	100	90,9

Radiological Staging

	0	1	2	3
0	6	1	1	
1	1	15	1	
2		1	4	
3			3	0

Correct staging: pts 1-16 13/16 81.3%; pts 17-33 12/17 70.6%



Conclusions

Hydro-MRI with five sequences is accurate for T (60-90%) and N (70-90%) staging of gastric adenocarcinoma. T2W TSE-FS Blade/Propeller sequence is a fast and efficient technique for overall evaluation of the disease. DWI non-BH provided additional qualitative information for N staging. T1W GRE-3D p/gad. (contrast-enhanced) images were useful for T staging, specially with multiplanar reconstructions.

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Material and methods

From 10/08 to 01/10, 33 patients (20M, 13F, median age: 58.6, 29-79 y.) with an endoscopic diagnosis of gastric carcinoma underwent abdominal MRI and were operated upon with pathological analysis available (Median interval: 16.2 days, 1sd:6-34d). MRI evaluation was approved by the multidisciplinary gastric cancer group and consented by all patients.Previous abdominal CT (spiral or multidetector) was included in the evaluation. MRI evaluation: 1,5 Tesla Siemens Avanto. Studies were analised in consensus by two imagiologists.

MR staging criteria: T and N disease

T1: lesion less than 3 cm long with external regular contour or without transmural contrast enhancement. T2: mural lesion longer than 3 cm with regular external contour or smaller than 3 cm with transmural enhancement. T3: irregular contour, focal bulging, perigastric streaking T4: lack of cleavage plan/compression of vicinity organs.

Nodal compromise: diameter superior to 9 mm, with contrast enhancement or high signal on high b-value of DWI; aggregate of 4 or more nodes bigger than 5 mm. N1:1-3 criteria, N2: 3-5 criteria, N3: 6 or more criteria.

Results: T-Staging (33 pts, 34 lesions)

Pathological Staging

%	Sens.	Spec.	Accu.
<u>T0</u>	0	97	97
<u>T1</u>	40	100	91,2
<u>T2</u>	50	64,3	61,8
<u>T3</u>	60	71,4	63,4
<u>T4</u>	33,3	96,7	91,2

Radiological Staging

	0	1	2	3	4
0	0				
1		2	3		
2	1		3	2	
3			7	12	1
4				2	1

Correct staging: pts 1/16 7/16 43.8%; pts 17-33 11/17 64.7%

