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Diagnostic Radiology

Hands on review with emphasis on pushing and infiltrative growth pattern of high risk STS (SSG XX) (Veli Söderlund).

MRIs of 10 randomly selected patients from the tumor file of the University Hospital of Lund were reviewed by 6 musculoskeletal radiologists (1 Stockholm, 2 Umeå, 2 Lund). The review was first carried out individually and then in group trying to reach consensus. The variables (growth pattern, tumor location, presence of necrosis and bleeding), as recorded individually are shown in table 1.

There were 9 tumors with histological infiltrative and only one with pushing growth pattern. The radiologists were not informed before the evaluation about the histological findings. 3 of the 10 cases were assessed as pushing and one as infiltrative by all 6 radiologists. Notably only one case was assessed as infiltrative by all of the six. In the remaining 6 cases the assessment of growth pattern varied.

Tumor location was assessed either subcutaneous or deep by all the 6 radiologists in 8 cases. There was discrepancy in 2 cases.

Assessment of tumor necrosis and bleeding showed marked interobserver variation. After informing radiologist about histological findings the evaluation in group did not improve the results.

One of the 3 cases assessed as pushing was correct. However, the case believed pushing by the group was not correctly recognized (case 6).

The assessment and differentiation between bleeding and necrosis showed a large interobserver variation.

Table 1. The assessments of the individual evaluation of the 10 cases. The figures show the number of coinciding assessments.

Case	Variables											
	Pushing	Infiltrative			Sub cut•	Deep	Necrosis			Bleeding		
		No	focal	diffuse			yes	no	na**	yes	no	na**
1	2	3				5	3	2			5	
2	5				2	3	1	1	3		2	3
3	2	1	2		5		2	3		1	4	
4		1	4		3	2	4	1		1	4	
5			2	3		5	1	4		1	4	
6	5					5	1	4			5	
7	2	1	1	1	5			5			5	
8	3		2			5		5		1	4	
9	5				5			2	3	2		3
10		1	3	1		5	5			2	3	

• subcutaneous, \*\* not assessable

## Discussion

There was a surprising variation of the assessment of the sex radiologists regarding tumor growth pattern, necrosis and bleeding. After informing the radiologists that only one of the 10 cases exhibited histologically pushing growth, they could not recognize it.

The assessment of tumor location showed small interobserver variation. Two cases were assessed both as deep and subcutaneous and at re-review tumor origin could not be assessed as primarily deep with subcutaneous extension or vice versa. Both tumors were large and distorted the local anatomy. These had most likely been assessed as not assessable regarding location. Notably the form lacked this alternative.

It is obvious that bleeding can not be distinguished from necrosis. This assessment should probably be replaced by recording the presence of probable necrosis or bleeding.

The MRIs were performed according to routine tumor protocol. A number of examinations were considered sub optimal (motion artifacts, thick slices, large FOV) regarding the variables recorded. The results might improve by use of the imaging protocol proposed in SSG XX protocol, in which a transaxial T2-weighted FSE is included. The latter is probably the most sensitive in assessment of tumor growth pattern.