

Bone scintigraphy and X-ray in detection of active osteoarthritis & their relation to type of knee pain. A ROC analysis.

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Bone scintigraphy is a valuable method for detecting synovitis in knee joints with severe osteoarthritis. Both clinical symptoms and proven hyperperfusion set the indication for radionuclide synovectomy (RS)..

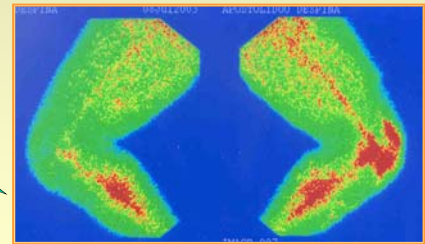


412 knee joints with OA of 206 patients (69±7.3years old) referred for RS treatment enrolled in this study.

All joints were classified by X-ray Steinboecker system

8.3% as grade 0
26.2% as grade I
30.3% as grade II
27.2% as grade III
7.7% as grade IV

Two-phase bone scintigraphy was performed after i.v. injection ^{99m}Tc-MDP according to the procedure guidelines of our department and intensity of tracer accumulation in joints was scored independently by two experienced observers.



80.8% BP (+)
72.3% SS (+)

clinically evaluated, classified by type of pain (only under stress/ both under stress and rest).

85.9% only stress pain
34.5% continuously

RESULTS

continuous pain - blood pool				
Count		blood pool		Total
		(-)	(+)	
pain	no	75	195	270
	yes	4	138	142
Total		79	333	412

continuous pain - static				
Count		static		Total
		(-)	(+)	
pain	no	100	174	274
	yes	14	124	138
Total		114	298	412

only stress pain - blood pool				
Count		blood pool		Total
		(-)	(+)	
pain	no	46	12	58
	yes	33	321	354
Total		79	333	412

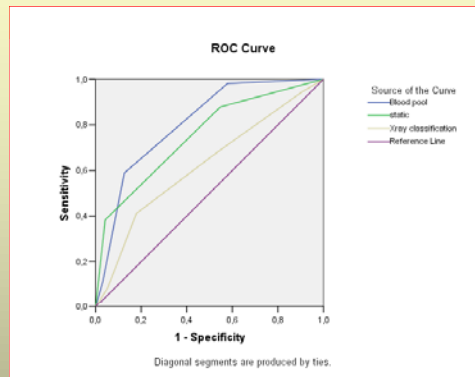
only stress pain - static				
Count		static		Total
		(-)	(+)	
pain	no	55	8	63
	yes	60	289	349
Total		115	297	412

BP had a sensitivity of 0.91, specificity of 0.82, PPV of 0.96 and NPV of 0.59 at exercise pain and 0.97, 0.28, 0.42 and 0.95 at continuous pain respectively. All values were critically better than these of SS and Xray.

continuous pain - Xray CLASSIFICATION							
Count		RADIOCLASSIFICATION					Total
		0	1	2	3	4	
pain	no	29	77	82	64	18	270
	yes	6	31	43	48	14	142
Total		35	108	125	112	32	412

only stress pain - Xray CLASSIFICATION							
Count		RADIOCLASSIFICATION					Total
		0	1	2	3	4	
pain	no	13	28	15	2	0	58
	yes	22	80	110	110	32	354
Total		35	108	125	112	32	412

To check scintigraphy or simple Xrays' ability to evaluate dolorous active synovitis complete statistical Receiver Operating Characteristic curves were analyzed.



Area under ROC curve for BP was larger than this for SS and for Xray (the smallest) in painful joints (0.807, 0.752 and 0.61 respectively) with statistically significant differences.

CONCLUSION



BB scintigraphy is a useful technique for detecting active synovitis in knee joints with OA better than static scan (SS) or simple Xray.

Tracer accumulation is strongly related to the type of pain.