HAEMOPHILIC ARTHROPATHY: IMAGE EVALUATION AND INTEROBSERVER RELIABILITY

Isabel Elia[a], Cristina Ramirez[a], Daniel Sánchez[a], Jesus Collado[a], Sofia Perez-Alenda[bc], Juan J Carrasco[b], Santiago Bonanad[c], Felipe Querol[bc]

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[a]Radiology Service, University and Polytechnic Hospital La Fe, Valencia, Spain.
[b]Department of Physiotherapy, University of Valencia, Spain.
[c]Haemostasis and Thrombosis Unit, University and Polytechnic Hospital La Fe, Valencia, Spain.

1. Introduction and Objectives:

In patients with haemophilia, the prevention of arthropathy is the main objective of therapeutic replacement of coagulation factors. MRI and ultrasound allows early diagnosis of joint disorders, but conventional radiology (Pettersson score) remains the universal method to objectify the joints status in the haemophilic patient.

The aim of this study is to determine the joint state in a haemophilia population and assess interobserver reliability in diagnostic imaging.

2. Materials and Methods:

The Thrombosis and Hemostasis Unit of University and Polytechnic Hospital La Fe, controls 129 severe haemophilic patients. Two observers performed an independent evaluation of the radiographic examination of 90 patients, 524 joints (elbows, knees and ankles) and a total of 1048 images. The interobserver reliability was determined by Intraclass Correlation Coefficient (ICC) for the total Petterson score of each joint and Cohen's kappa for each item score.

3. Results:

Table 1 shows that a very good ICC has been obtained in all joints. In addition, no significant differences (t-test) were found between the observers' scores. Table 2 shows a low degree of agreement in the osteoporosis of ankle, a moderate agreement in osteoporosis (elbow) and in Gross incongruence (ankle) as well as a good and very good agreement in the remaining items.

4. Conclusions:

Only seven of the 90 patients evaluated presents absence of haemophilic arthropathy. In conclusion a high interobserver reliability has been obtained, allowing a good control of the therapeutic for the prevention and treatment of hemophilic arthropathy.

Table 1. Average score obtained by the radiologists in each joint, results of the t-tests and ICC.

	Radiologist 1	Radiologist 2		
	Mean (SD)	Mean (SD)	p	ICC (IC 95%)
Right elbow	4.47 (5.15)	4.58 (5.21)	0.813	0.91 (0.87-0.94)
Left elbow	4.86 (5.21)	5.07 (5.45)	0.852	0.94 (0.91-0.96)
Right knee	3.84 (5.14)	3.42 (5.09)	0.473	0.92 (0.87-0.95)
Left knee	3.15 (4.72)	2.95 (4.86)	0.529	0.95 (0.92-0.96)
Right ankle	5.43 (5.22)	4.72 (4.62)	0.234	0.89 (0.83-0.93)
Left ankle	5.00 (5.39)	4.84 (4.84)	0.833	0.93 (0.90-0.96)
Total	26.06 (22.19)	24.61 (21.06)	0.654	0.93 (0.89-0.95)

Table 2. Degree of agreement for each Pettersson parameter score.

Item	Elbow	Knee	Ankle
1-Osteoporosis	0.59 (0.47-0.72)	0.81 (0.71-0.92)	0.21 (0.02-0.92)
2-Enlarged epiphysis	0.80 (0.70-0.89)	0.85 (0.76-0.94)	0.84 (0.76-0.92)
3-Irregular subchondral surface	0.75 (0.65-0.85)	0.81 (0.71-0.92)	0.75 (0.65-0.85)
4-Narrowing of joint space	0.77 (0.67-0.87)	0.93 (0.86-0.99)	0.81 (0.72-0.90)
5-Subchondral cyst formation	0.80 (0.71-0.89)	0.83 (0.74-0.92)	0.70 (0.59-0.80)
6-Erosions of joint margins	0.81 (0.68-0.94)	0.77 (0.66-0.88)	0.75 (0.65-0.85)
7-Gross incongruence of articulating bone ends	0.66 (0.52-0.80)	0.70 (0.55-0.86)	0.58 (0.43-0.73)
8-Joint deformity	0.77 (0.66-0.88)	0.80 (0.68-0.92)	0.69 (0.56-0.81)

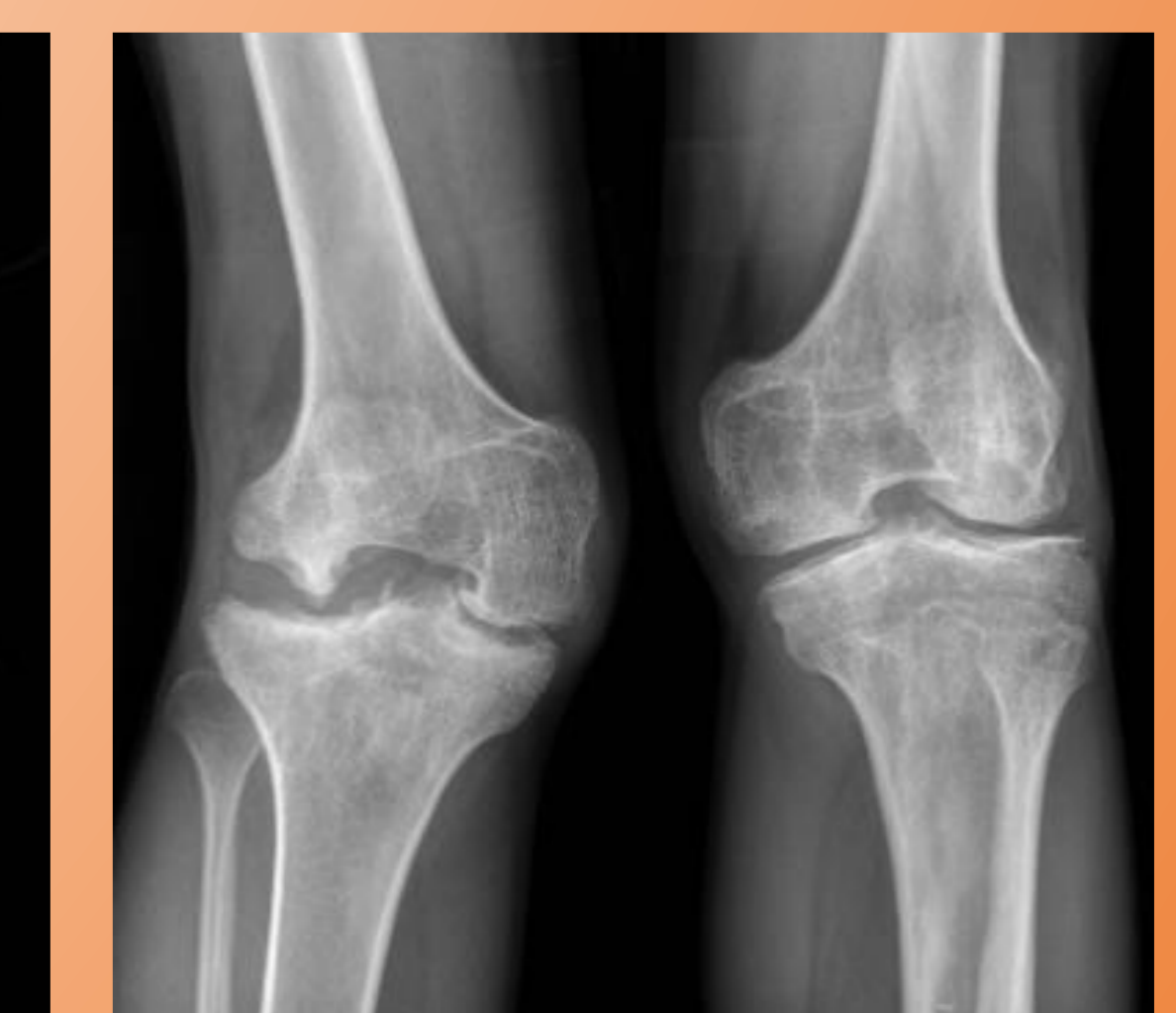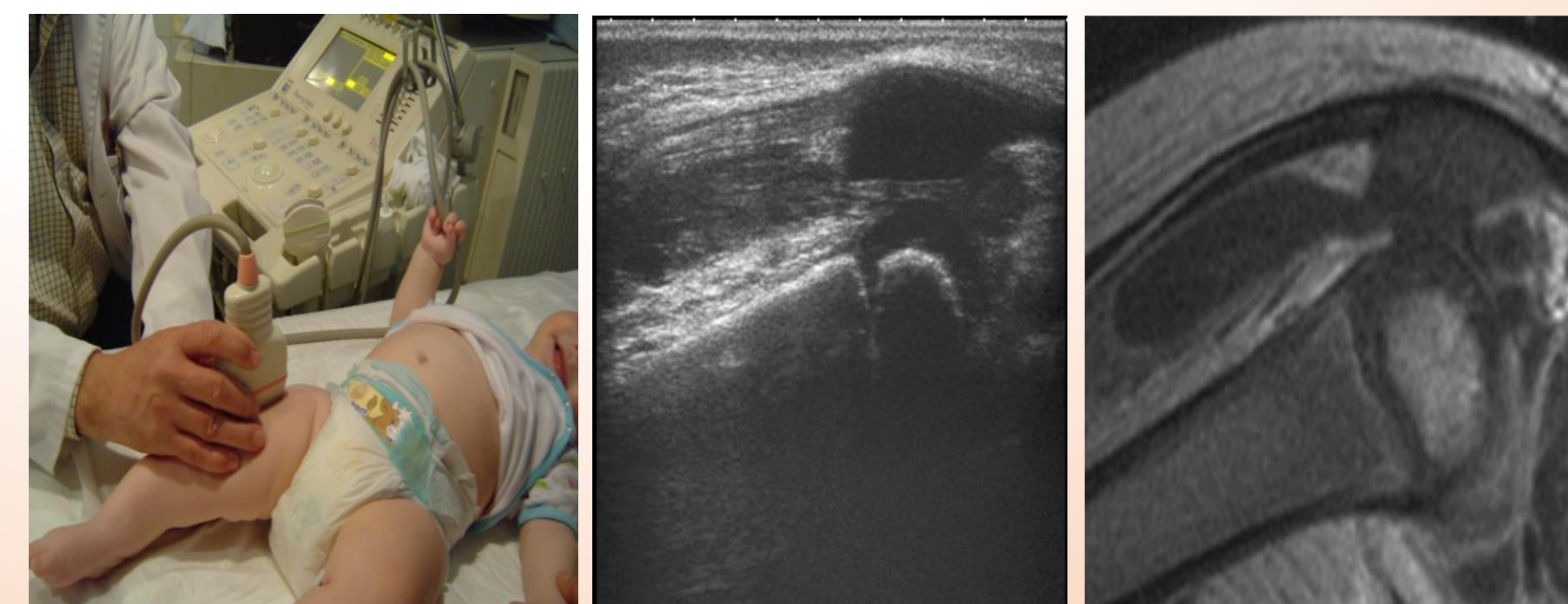Elbows 0 points.
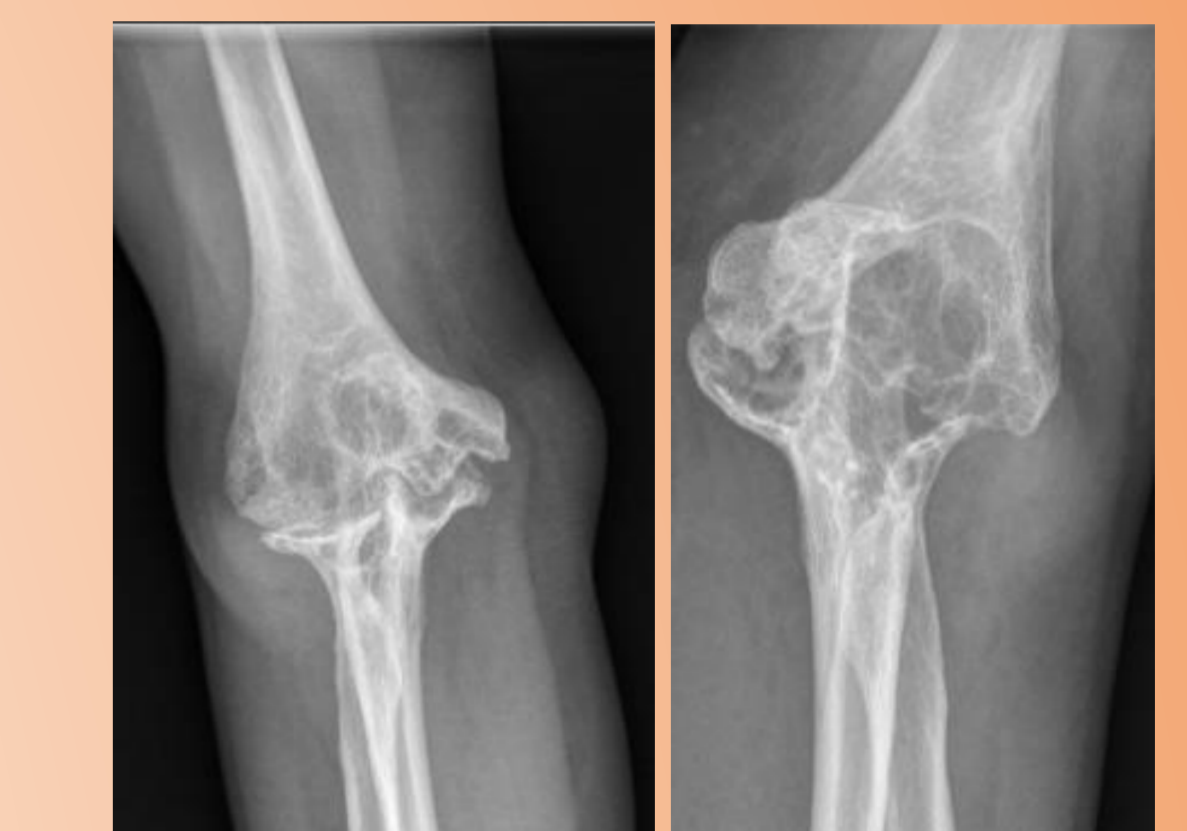
Elbows 13 points.
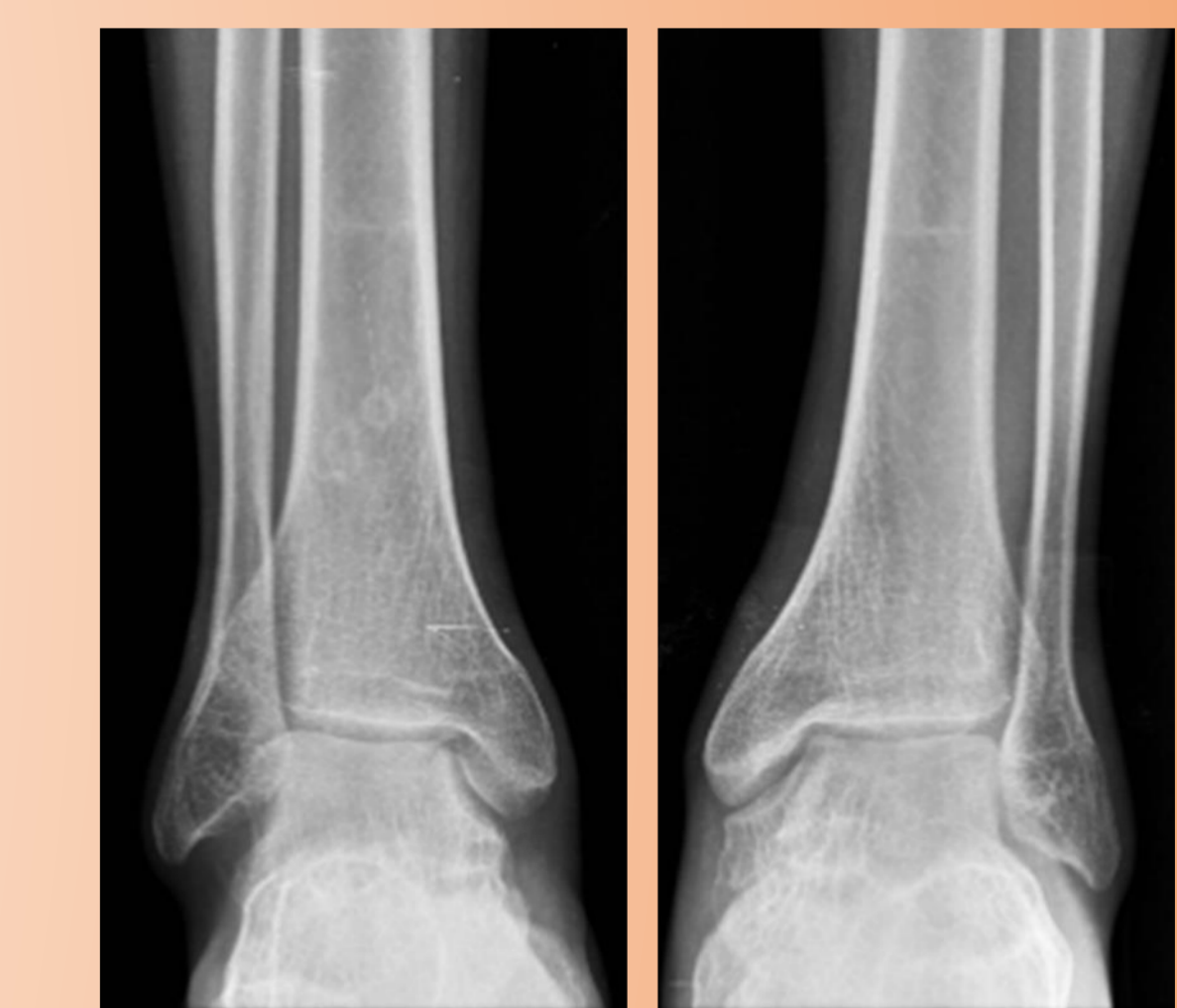
Ankles 0 points.

Ankles 11 points.

Ultrasound and MRI comparative images.

Knees 0 and 11 points.

Knees 13 points.