



# A Combined Ultrasonographic and Simple Radiographic Study for Hemophilic Arthropathy

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## Introduction

In hemophilia, an accurate evaluation of joint condition is a prerequisite for a correct therapeutic approach. Then, the evaluation of joint conditions is very important not only for staging the joint damage but also for the follow-up of prophylaxis and providing proper rehabilitative approach. Hemophilic joint disease can be diagnosed by various imaging studies. But, the X-ray is difficult to find early joint pathology and adjacent soft tissue structures and ultrasonography has a limitation to evaluate internal bony structures. The MRI provides full information about the pathology of the synovium, articular cartilage and bone. However, it is too expensive, and maybe cumbersome in young children who require sedation. Therefore, we try to know whether a combination ultrasonography and simple radiography can be used as a cost-effective imaging tools for the evaluation of hemophilic joint and adjacent structure and it reflects the functional status in hemophilic patients.

## Subjects and Methods

- ◆ 35 males (mean age 16.89±12.58 years, severe 33, mild 2) with hemophilic arthropathy (Table 1).
- ◆ Ultrasonography system (ACCUVIX V20, Samsung-Medison Co., Seoul, KOREA) with 7.5 MHz transducer (Model L5-13S).
- ◆ The modified Ultrasonographic score (US) for the hemophilic arthropathy on the knee, ankle joints (by Melchiorre et al., Hemophilia, 2011).
- ◆ The severity of hemophilic arthropathy on the X-ray was determined using the Pettersson score (PS) on the knee, ankle joints.
- ◆ Physical examination score : Gilbert scale and Hemophilic Joint Health Score (HJHS).
- ◆ Functional level of ADL : Functional independence score in hemophilia (FISH) and Hemophilia activities list (HAL)
- ◆ We performed a correlation analysis between the imaging score and the joint impairment score as well as the functional score.

**Table 1. General characteristics**

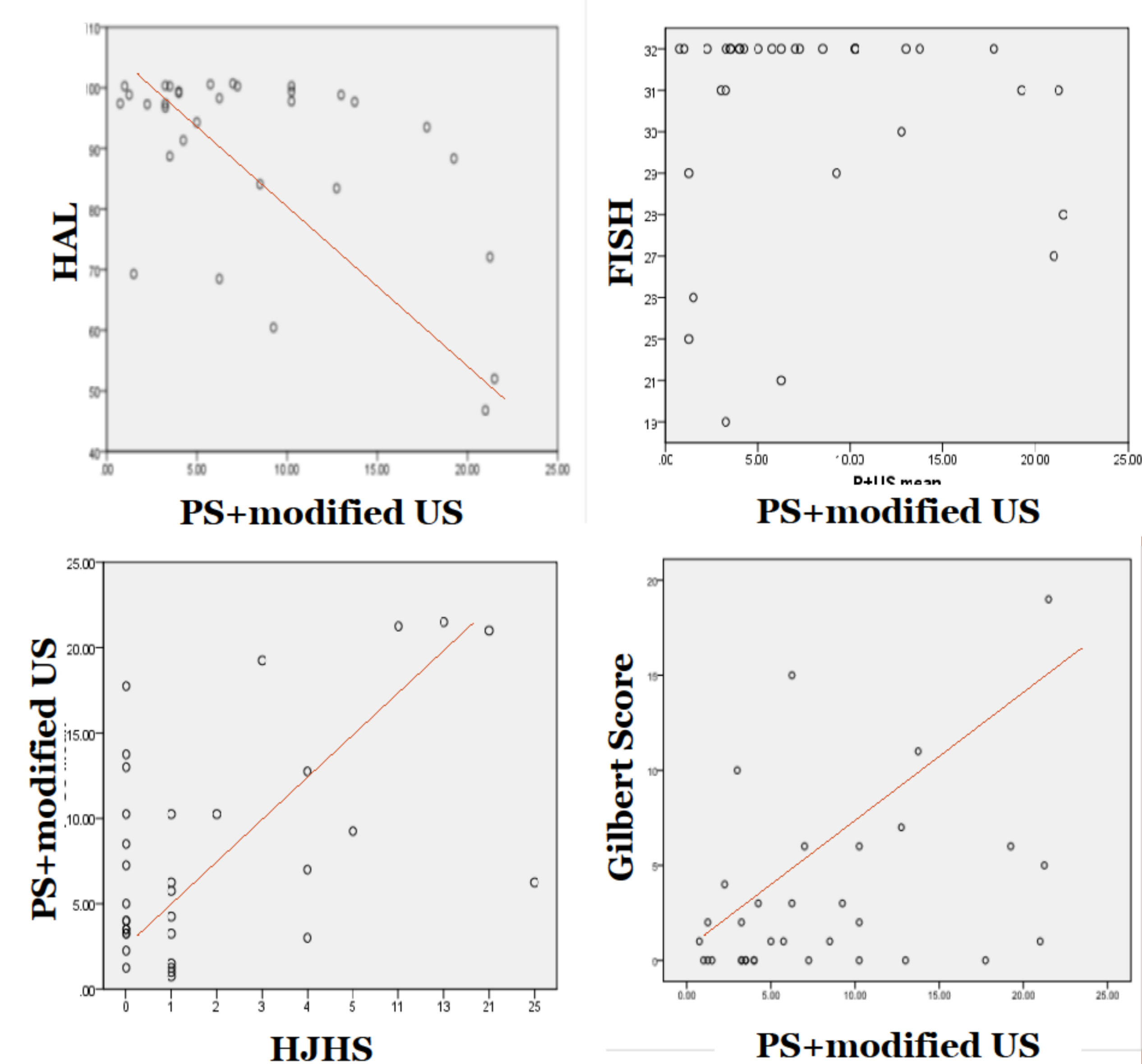
Parameters	
Age	16.89±12.58 years
Severity (N)	Severe (33), mild (2)
Deficit factor (N)	VIII (34), IX (1)
Primary prophylaxis	22
Sex	All male

## Results

1. The mean score of modified US was 4.97±3.99 points and the mean score of PS was 2.85±2.91 points, then a combination score was 7.83±6.31 points (Table 2).
2. HJHS was 2.97±5.09 and Gilbert score was 3.53±5.45.
3. HAL score was 89.80±15.11 and FISH score was 30.29±3.22.
4. The combination score (PS+modified US) was a significant correlation (Fig. 1) with HJHS (p=0.006) and Gilbert score (p=0.019) as well as HAL score (p=0.002).

**Table 2. The results of Imaging Study and Functional State in Patients**

Classification	Assessment tools	Results
Imaging score	modified Ultrasonographic score (US)	4.97 (3.99)
	Pettersson score (PS)	2.85 (2.91)
	modified US + PS	7.83 (6.31)
Joint impairment assessment	Hemophilic Joint Health Score	2.97 (5.09)
	Gilbert score	3.53 (5.45)
ADL evaluation	Hemophilic activities lists	89.80 (15.11)
	FISH	30.29 (3.22)



**Fig. 1. The correlation between a combined imaging score and functional scores**

## Conclusions

A combination of simple radiological and ultrasonographic evaluation ultimately impact on the optimal evaluation of joint impairment and functional status in hemophilic arthropathic patients. This assessment is cost effective and useful for diagnostic tool of early detection in hemophilic arthropathy.

