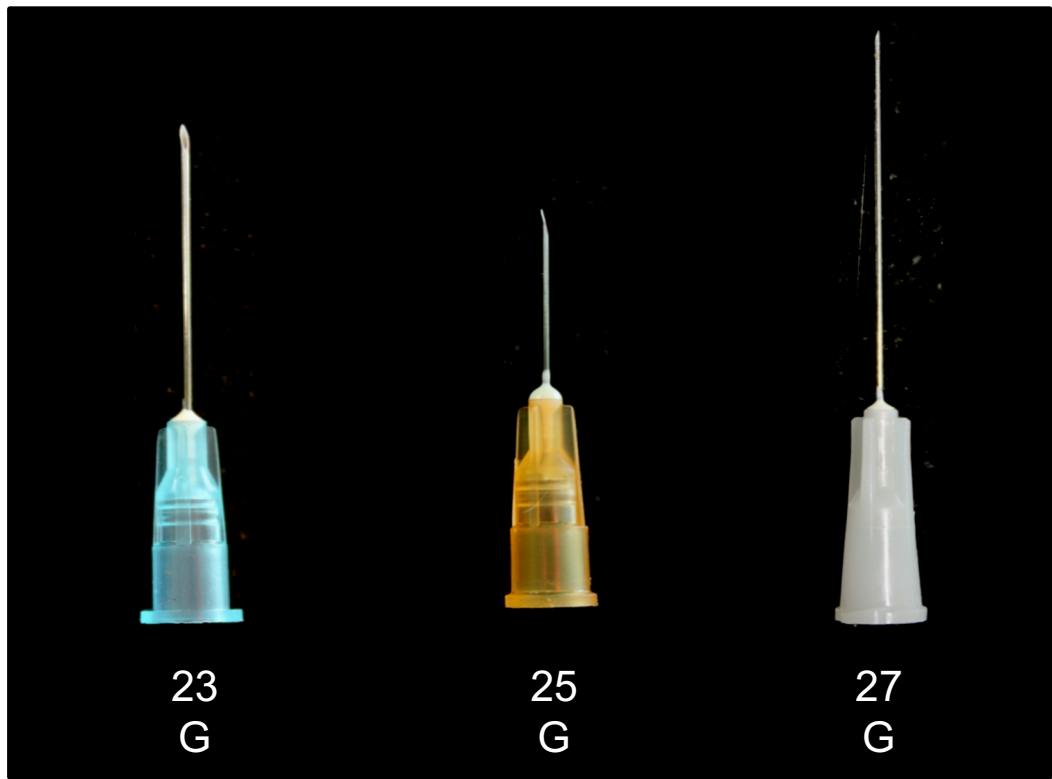


# NEEDLE USED FOR ULTRASOUND GUIDED ASPIRATION HAS AN EFFECT ON SPLENIC SPECIMEN AND PAIN INDUCED IN DOGS

## Introduction

Modifications of splenic parenchyma are common ultrasonographic findings in dogs as this hemic organ can be involved in a wide variety of disease. Splenic fine needle aspiration (FNA) is a rapid, safe procedure, routinely performed in veterinary institutions. Despite its wide use there is little information about the size of the needle that should be used to perform the sampling.



## Aims

**Assess the effect of needle size on cytologic specimens evaluation and animal pain induced by the needle insertion**

## References

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## Methodology

Client-owned dogs with ultrasonographic modifications of the splenic parenchyma or presented for grading purpose were included in this prospective study.

### 1. Pain evaluation

Pain induced by the procedure was subjectively assessed by a veterinarian present in the room examination, different from the sonographer, blinded to the needle size and previously trained to detect pain and discomfort in dog and to report it on a numerical rating scale (from 0 to 10) specially designed for this purpose (Table 1). If sedation was needed to perform the sampling, the dog was excluded from the study.

Score	Dog's behavior
0	None
1	Subtle skin reaction whitout any sign of dog discomfort
2	Mild skin reaction without any sign of dog discomfort
3	Dog's head movement toward the operator
4	Dog movement toward the head of the operator
5	Mild movement of the body of the dog
6	Moderate movement
7	Movement of the body and vocalize a little
8	Movement of the body, vocalize and change behavior afterward
9	Wants to get out
10	Aggressiveness

Table 1 : Scoring system for pain evaluation

Three FNA were performed on each dog using three different needles (23G, 25G, 27G) in randomized order using the non-aspiration technique. Cytologic samples were independently, randomly and blindly evaluated by one or two cytologists.

Splenic parenchyma structures	Components	Scoring		
		A	B	C
Red pulp	Isolated components	Stroma		
		Pigments		
		Fibroblastes		
		Macrophages		
		Mast cells		
White pulp	Isolated components	Dense sheaths of lymphoid tissue		
		Lymphocytes		
		Plasma cells		
		Blastic cells		
Capsule		Mesothelial cells		
Myelopoesis		Erythroid precursors		
		Myeloid precursors		
		Platelet precursors		
Others		Platelet clumps		
		Neoplastic cells		
		Leukocytes		

Table 2 : Individual scoring from for detailed cytologic evaluation

### 2. Initial cytologic evaluation

Initial cytologic evaluation used a subjective scoring system (from 0 to 3) inspired by Leblanc assessing cellularity, haemodilution and cell morphology.

### 3. Detailed cytologic evaluation

Detailed cytologic evaluation assessed 17 variables/criteria potentially found on a spleen cytologic specimen (Table 2). These were scored (from 0 to 3), considering their respective amount on the slides.

## Results

Fifty-four client-owned dogs were included in this study. Repartition of dogs among the different groups is presented in Figure 1.

### 1. Pain evaluation

The use of a 27G needle was significantly associated with lower pain scores compared to a 23G needle. Regardless the needle size, 82,7 % (34/162) of the pain scores were between 0 and 1 (Table 3).

Needle Size	Pain score						Total	p value
	0	1	2	3	4	5		
23	32 (59,3%)	10 (18,5%)	6 (11,1 %)	0 (0%)	1 (1,9%)	5 (9,3%)	54 (100%)	23G/25G p=0,710
25	37 (68,5%)	5 (9,3%)	6 (11,1%)	2 (3,7%)	2 (3,7%)	2 (3,7%)	54 (100%)	23G/27G p= 0,016
27	44 (81,5%)	6 (11,1%)	3 (5,6%)	0 (0%)	1 (1,9%)	0 (0%)	54 (100%)	25G/27G p=0,120
Total	113	21	15	2	4	7	162	

Table 3 : Pain scoring according to the needle size

### 2. Initial cytologic evaluation

A statistically significant difference between 23G and 27G needles (p=0,002) was found for cellularity with 23G giving better results for this criterion (Fig 2).

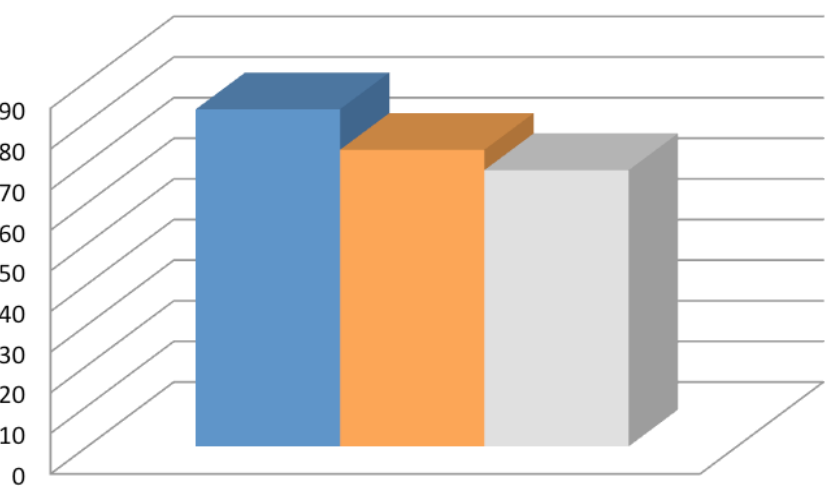


Fig2 : Cellularity cumulative scoring

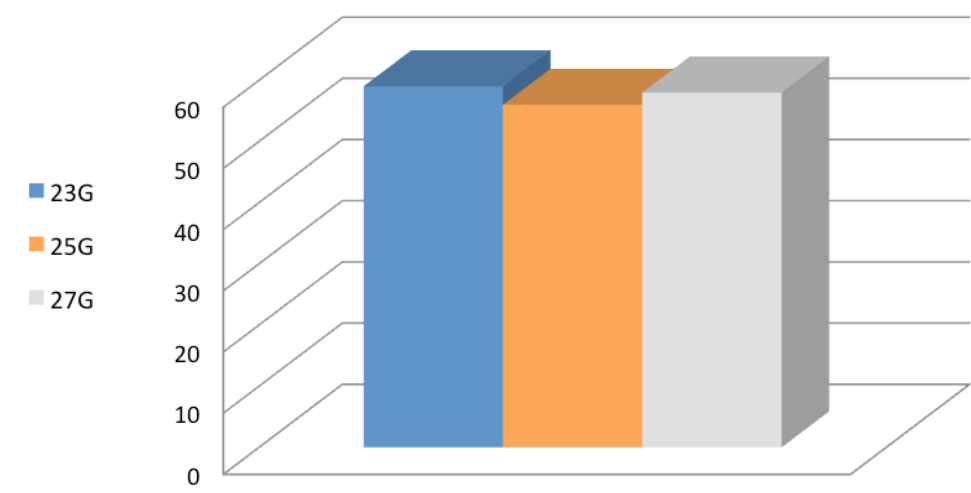


Fig3 : Haemodilution cumulative scoring

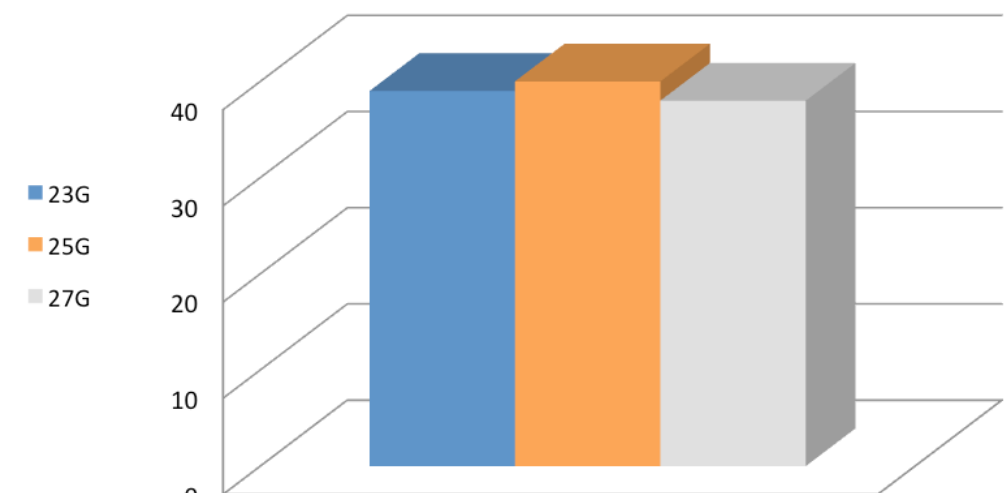


Fig4 : Cell morphology cumulative scoring

No statistical difference was found for amount of blood and cellular morphology between the three needles (Fig 3 and Fig 4).

### 3. Detailed cytologic evaluation

A statistical difference was found for stroma between 23G and 27G (p=0,001) and between 25 and 27G (p=0,021) with 23G needle getting the highest score (Fig 5). Mesothelial cells score was the highest with 25G needle comparing with the two others (p=0,002) (Fig 6).

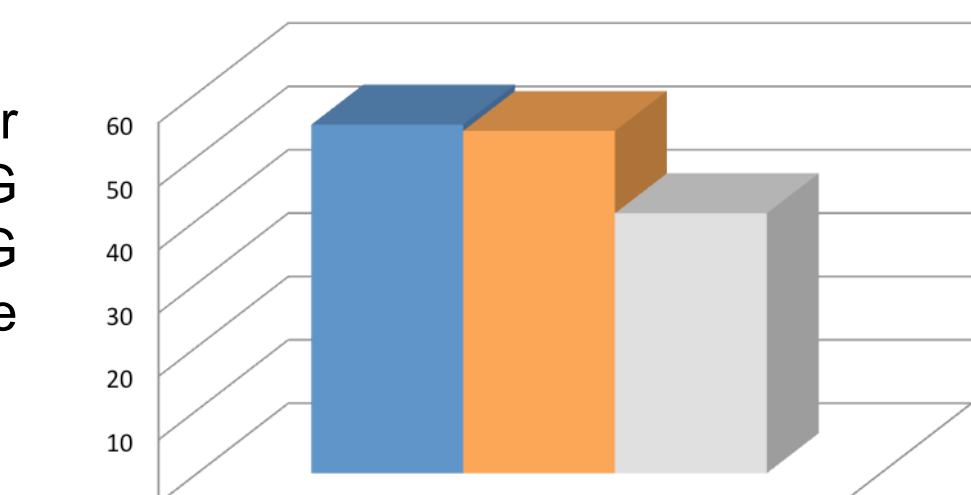


Fig5 : Stroma cumulative scoring

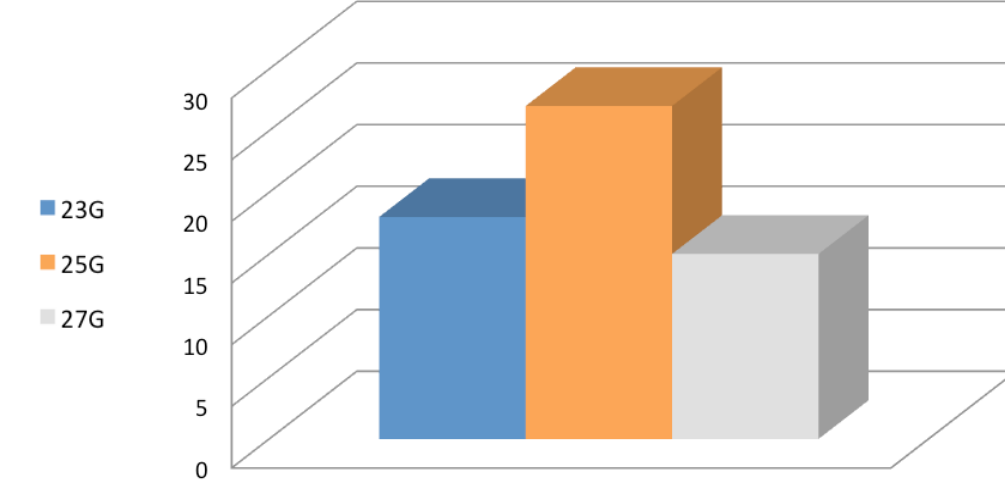


Fig6 : Mesothelial cells cumulative scoring

## Conclusion

Splenic fine needle aspiration is a well tolerated procedure. The use of a 25G seems to represent the best compromise between animal welfare and quality of the samples.