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Morphometric study of the venous jugularis externa valvula in the dromedary (*Camelus dromedarius*, L. 1758)

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INTRODUCTION

- The external jugular vein (EJV) in camels is responsible for draining the majority of the whole head and neck. The presence of venous valves in the (EJV) prevents the venous blood from flowing back [1].
- Although the venous valves are the subject of a large number of studies in human medicine [2-3], the animal studies in that field are very modest. In the camel, a species with a particularly developed neckline, the venous valves in the (EJV) have already been reported [4-5], but until now the difference between the right jugular vein (rEJV) and left jugular vein (lEJV) has never been described.

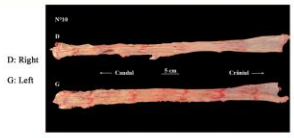
OBJECTIVES

Describe the distribution of venous valves into the external jugular vein, right and left, in the adult dromedary (*Camelus dromedarius*, L. 1758) and the difference of valvular density (VD) observed between the right and left jugular veins.

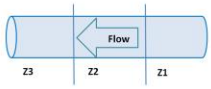
MATERIALS & METHODS

The rEJV and lEJV of 15 adult and healthy camels, of the "Sahraoui" and "Targui" breeds, which were of various ages and sexes, were harvested at the abattoir of Ouargla, Algeria.
The length of each vein (L) was measured from its origin to its entry into the chest, the number of venous valves (VNb) was counted and the valve density index (VD) was then calculated (VD = VNb / L) for each vein [6].
Each vein was divided in three zones by dividing the (L) by (3), the VNb and VD were calculated for each zone.

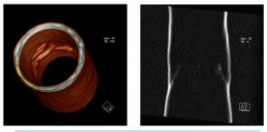
The spatial organization (3D) of a valve was demonstrated by the Computed Tomography (CT) Scanner (3-D), (*Cabinet d'Imagerie Vétérinaire de l'Ouest*, MORDELLES, France).



Measurement method of the external jugular vein

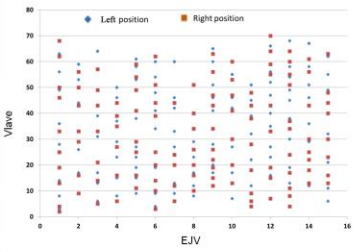


Z1 = the proximal part of vein (near its origin), Z2 = the middle part of vein, Z3 = the terminal par of vein


Valve showed by the scanner (3-D),

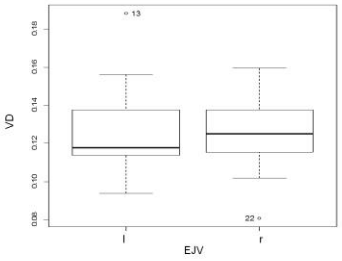
RESULTS

The venous valves are distributed homogeneously in the (rEJV) and (lEJV) of camels



Difference of distribution of venous valves in the (rEJV and lEJV), n (number of veins).

The valvular density is similar in the (rEJV) and (lEJV) of camels



Difference valvular density (VD) of the right (r) and left (l) external jugular veins (EJV).

- There is no difference of VD between rZ1 vs lZ1, rZ2 vs lZ2 and rZ3 vs lZ3, P > 0.05
- The valvular density in the (EJV) does not depend on the distribution of venous valves in (EJV)

VD	Mean	SD	P-value
lZ1	0,13	0,04	0,37
rZ1	0,14	0,04	
lZ2	0,13	0,04	0,63
rZ2	0,12	0,04	
lZ3	0,12	0,04	0,78
rZ3	0,12	0,04	

Mean and standard deviation (SD) of valvular density (VD) of the three zones of (EJV), lZ zone of the (rEJV), rZ zone of the (rEJV).

DISCUSSION

This preliminary study has made it possible to quantify and objectify the valvular distribution of the external jugular vein of the dromedary.
The pressure in the different parts of the (EJV) is adjusted by the important presence of the valvular system [4]. VD is similar in the proximal and terminal parts. Thus, the valvular distribution is not the only determining factor of the pressure adjustment at this level.
The identical valvular density in the (rEJV) and (lEJV), and the homogenous distribution of venous valves in these veins suggest that there is no preferred side when intervening on the (EJV) of camels.
It might be interesting to increase the number of animals and compare the results to other camel breeds or other species, especially regarding the size of the neckline.

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