

# Role of low-intensity pulsed ultrasound (LIPUS) in irradiated bone healing for the prevention of osteoradionecrosis : experimental study in the rabbit's mandible

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**Clinical problem** : Delayed radio-induced bone healing can lead to osteoradionecrosis, which endangers the quality of life of HNSCCs cancer survivors.

3 groups of rabbits : sham, irradiated, irradiated + LIPUS

Creation of a standardized bone defect

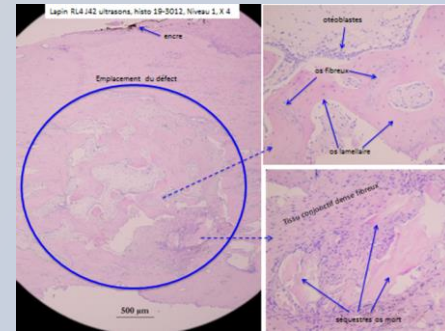
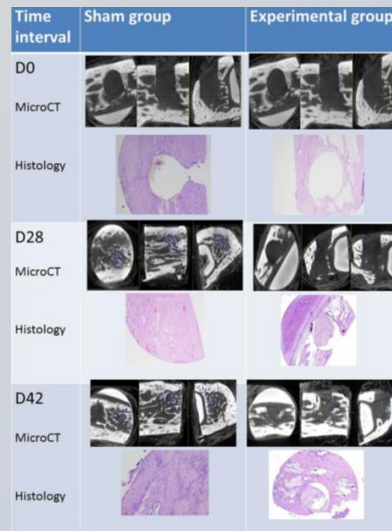


+/- External irradiation : 5 weekly sessions delivering 8,5 Gy each

+/- LIPUS : 10 postop sessions

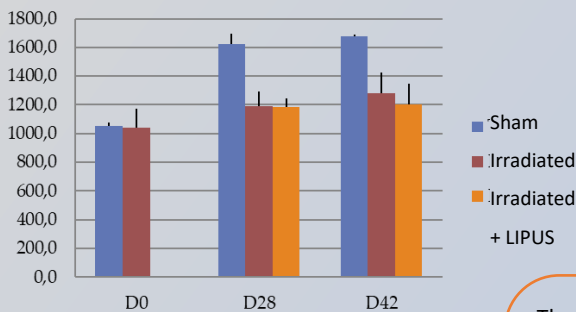
Sacrifices at D0, 21, 42  
Histology and microCT

		Sham group		Irradiated group	
		Value (mean)	SD	Value (mean)	SD
BMD (mg/cm <sup>3</sup> )	D0	1050.1	27.8	1038.8	131.2
	D28	1620.1	74.6	1191.9	101.8
	D42	1677.2	9.6	1280.5	143.2
BV/TV (%)	D0	1.48	0.6	0.22	0.2
	D28	30.77	2.6	4.17	6.28
	D42	42.57	12.25	16.27	12.41
TbN (1/mm)	D0	0.14	0.05	0.02	0.01
	D28	0.86	0.09	0.25	0.32
	D42	1.03	0.15	0.81	0.51
TbSp (mm)	D0	1.33	0.21	1.48	0.01
	D28	0.38	0.08	1.10	0.36
	D42	0.36	0.06	0.69	0.28

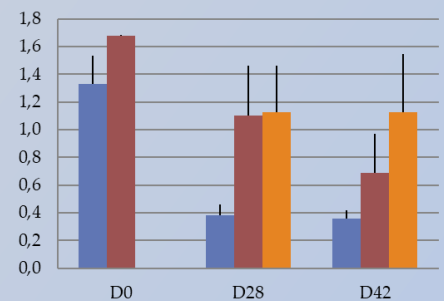


Irradiated + Lipus

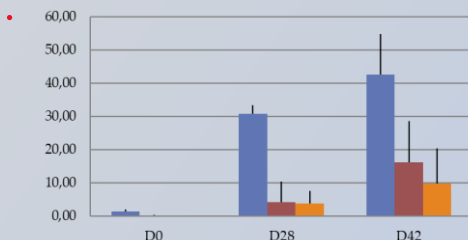
BMD moy (mg/cm<sup>3</sup>)



TbSp moy (mm)



BV/TV moy (%)



The radiation scheme used is **valid** : bone alterations and delayed healing are observed.

The role of **LIPUS** remains **unclear** in irradiated bone healing : role on angiogenesis? Rôle on cell différenciation?

**Limits of the study:**  
animal, external surgery ,  
less micro-organisms, size  
of the defect

TbN moy (1/mm)

