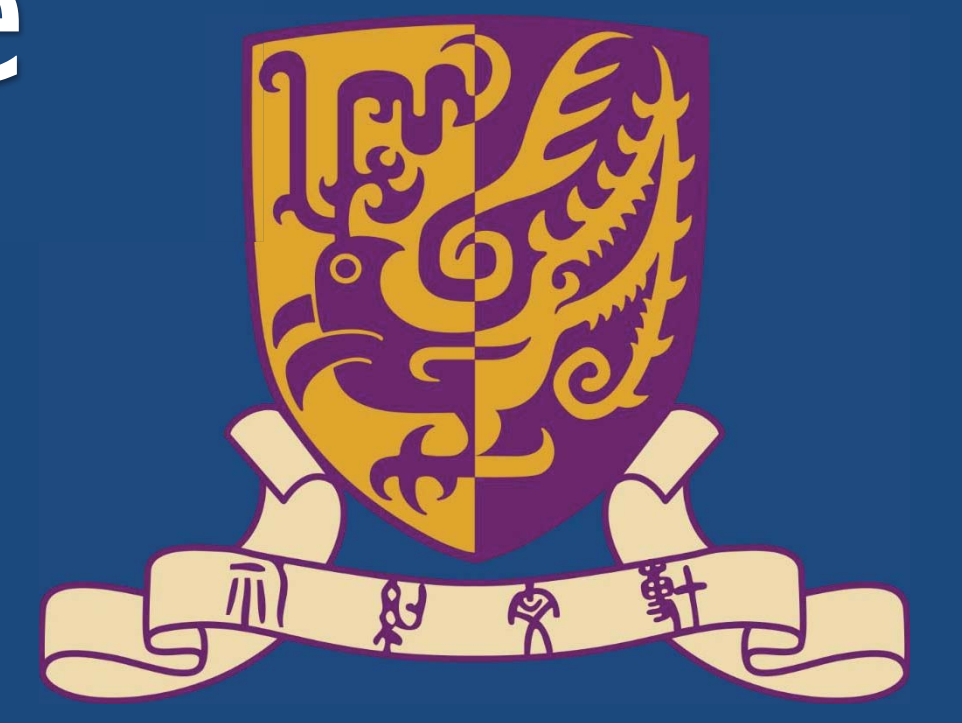


# Effects of Vibration Stimulation on Osteoporotic Fracture Healing in the Presence of Sarcopenia in Senescence Accelerated Mouse-Prone 8 (SAMP8) Rat Model



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## Introduction

In the past few decades, osteoporotic fracture has been recognized as one of the typical causes of disability and contribute the most in the rising of medical care expenditure. In addition, elderly will easily fall due to the decrease of muscle strength and together with increase of bone fragility leads to bone fracture.

Sarcopenia is associated with osteoporosis and it became more common in society due to aging population. Sarcopenia is an age-related systemic syndrome characterized by:

- 1) The decline of muscle strength
- 2) Progressive decrease of muscle mass
- 3) Poor physical performance.

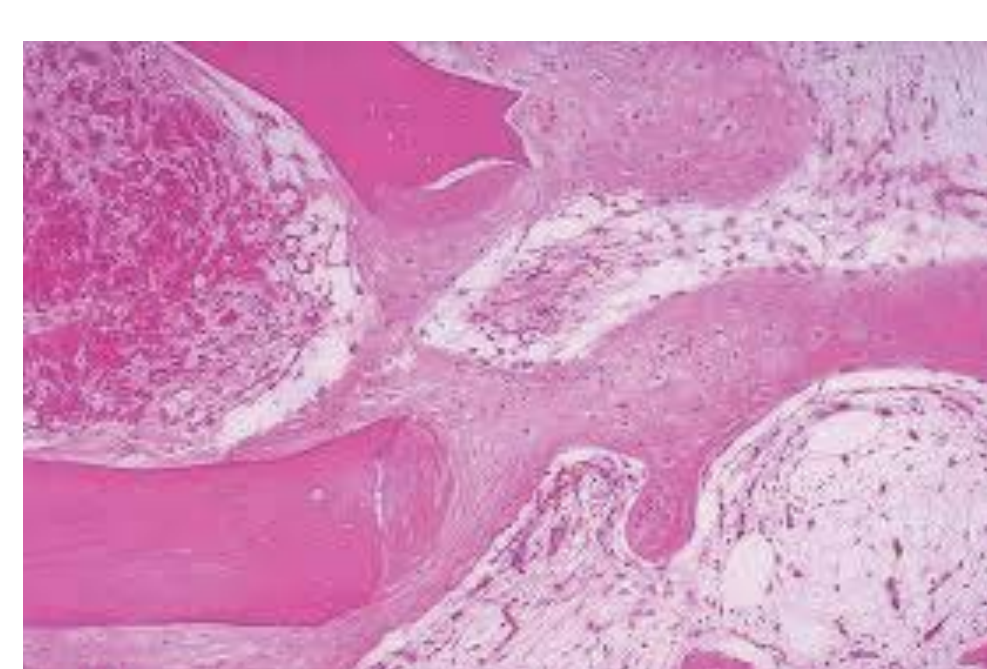
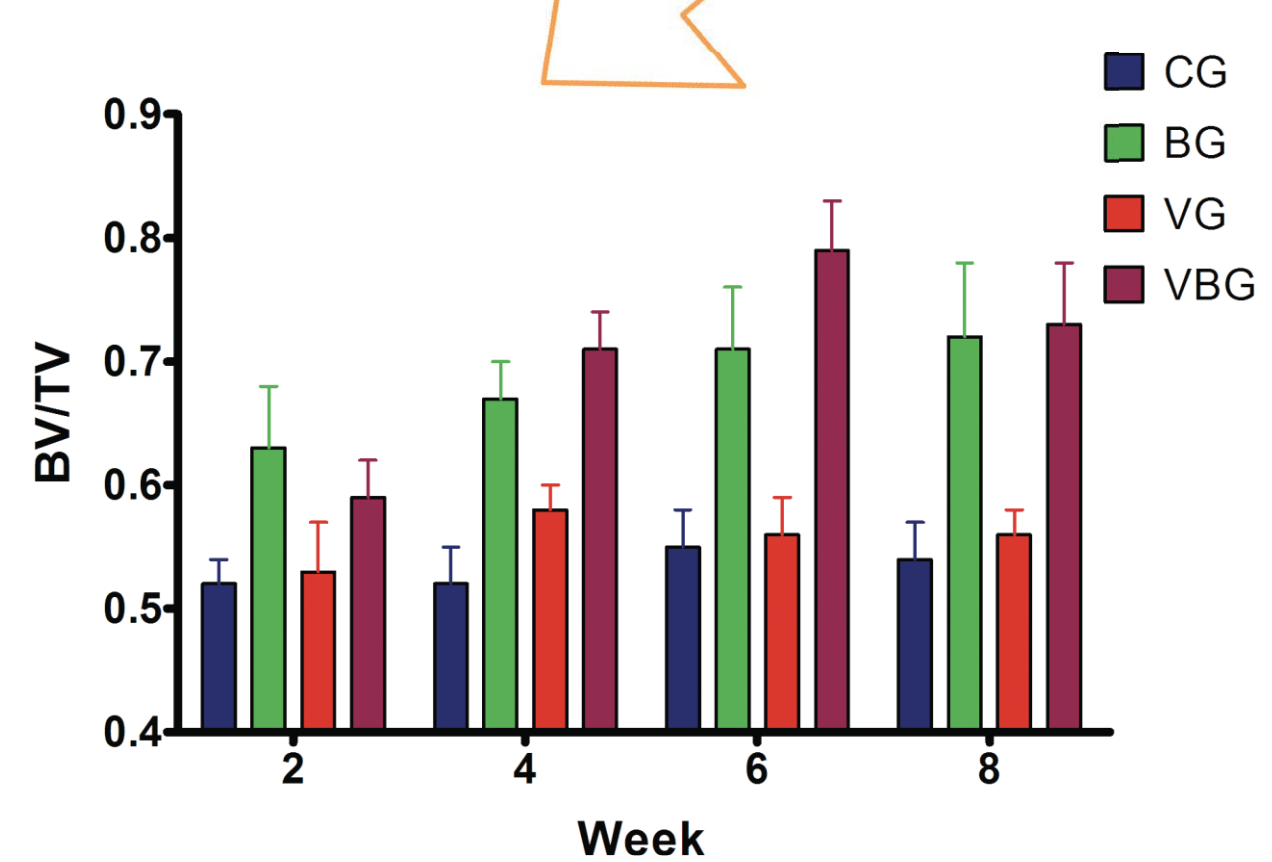
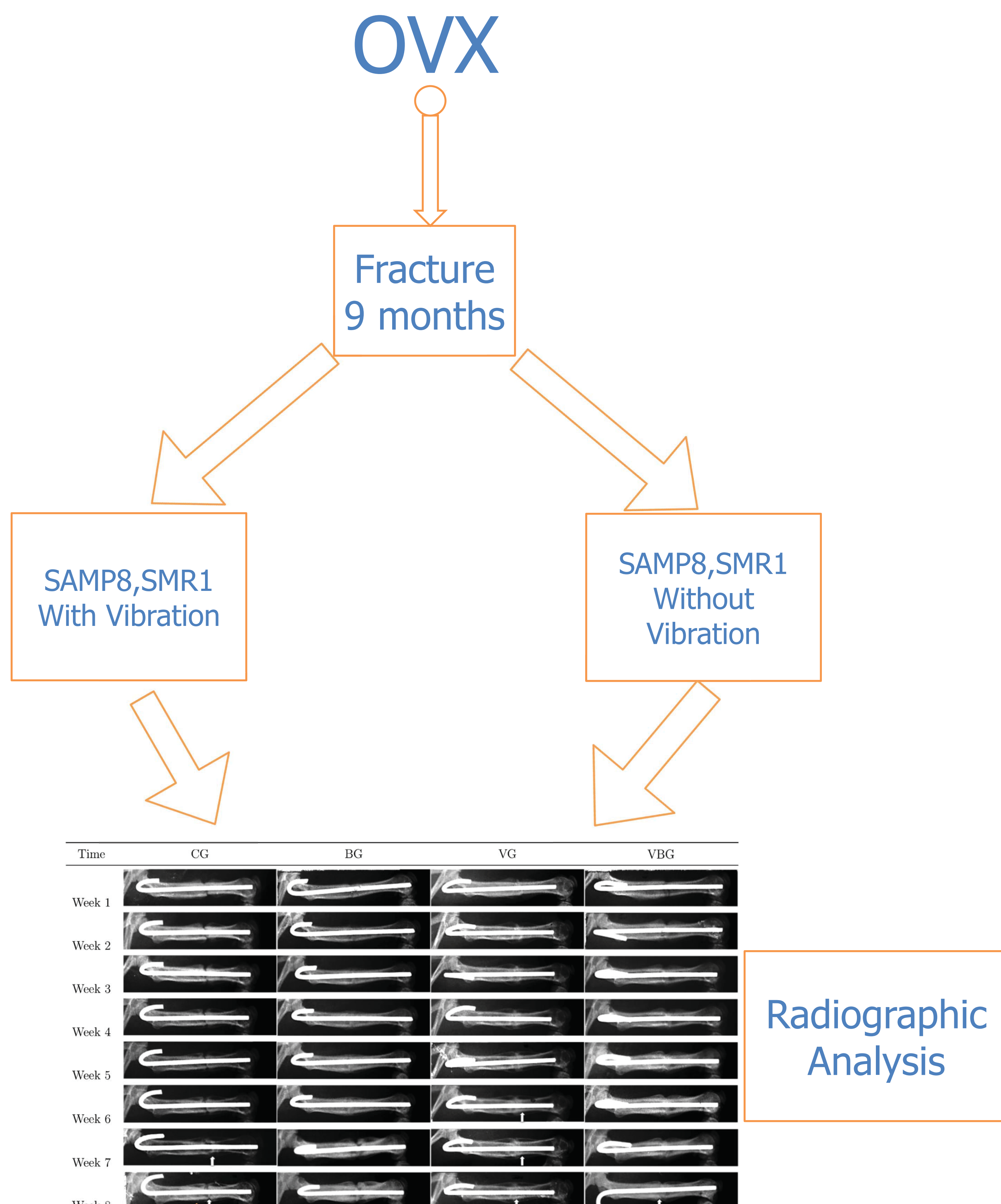
Low-magnitude high frequency vibration (LMHFV) has recently been proven to be osteogenic in osteoporotic intact bone, fracture healing, sarcopenia and beneficial to musculoskeletal system. However, the effect of LMHFV on osteoporotic bone fracture with the presence of sarcopenia is still unknown.

**Aims:** Investigate and evaluate the efficacy of low-magnitude high-frequency vibration stimulation on osteoporotic fracture healing in the presence of sarcopenia.

## Hypothesis

LMHFV can increase the rate of osteoporotic fracture healing and the recovery of sarcopenia at the same time.

## Materials and Design



MicroCT Analysis

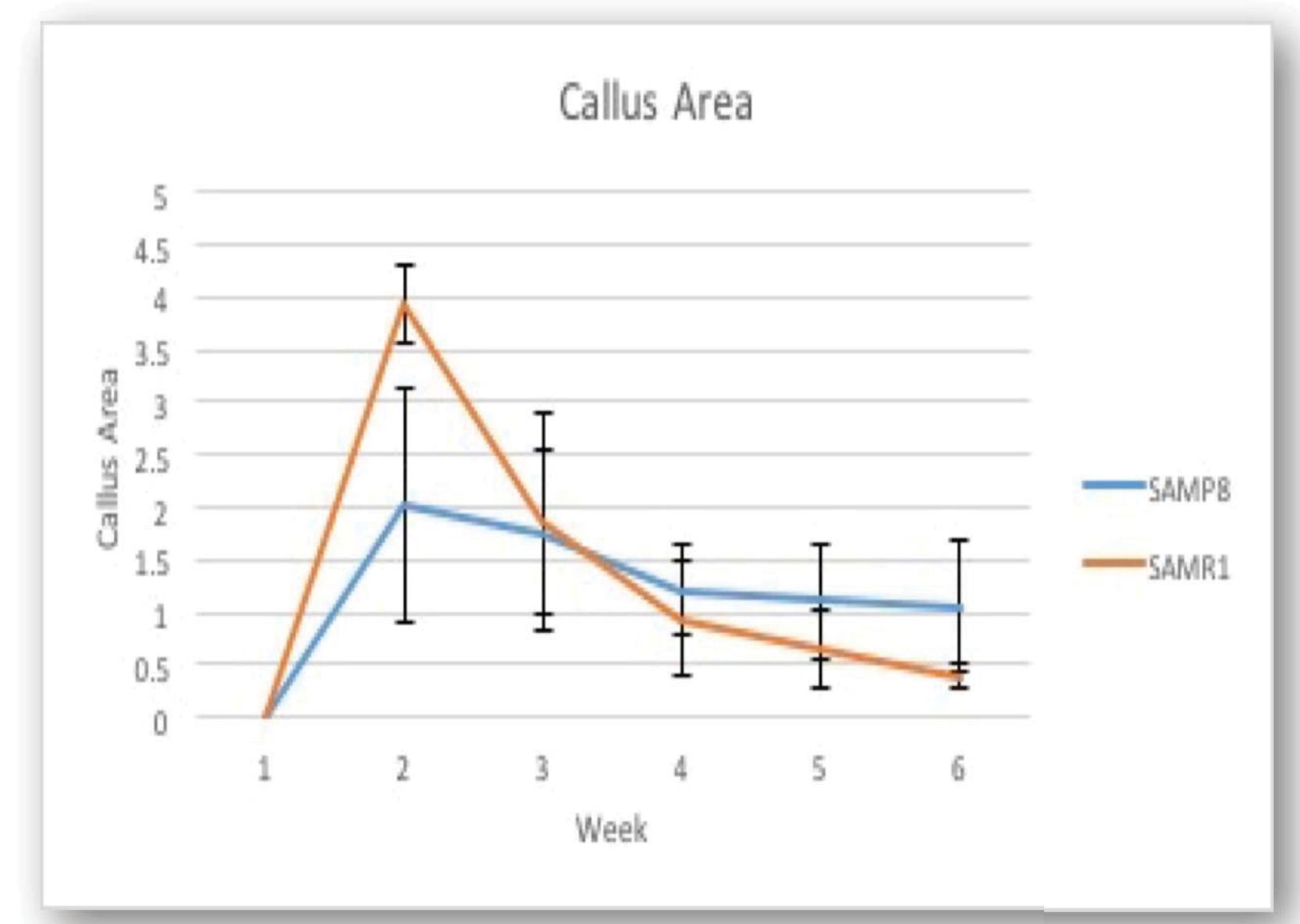
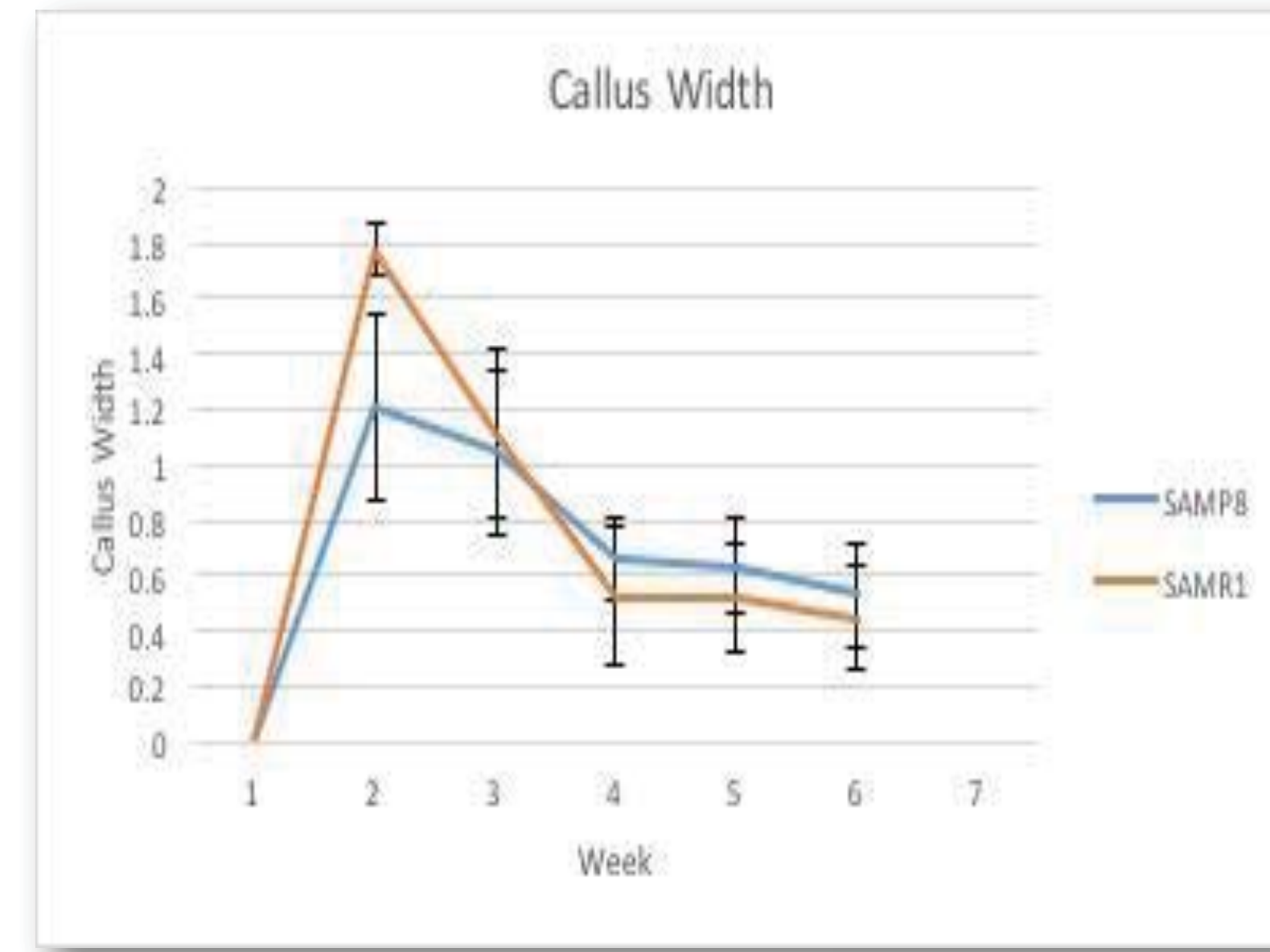
Histomorphometric Analysis

## Results

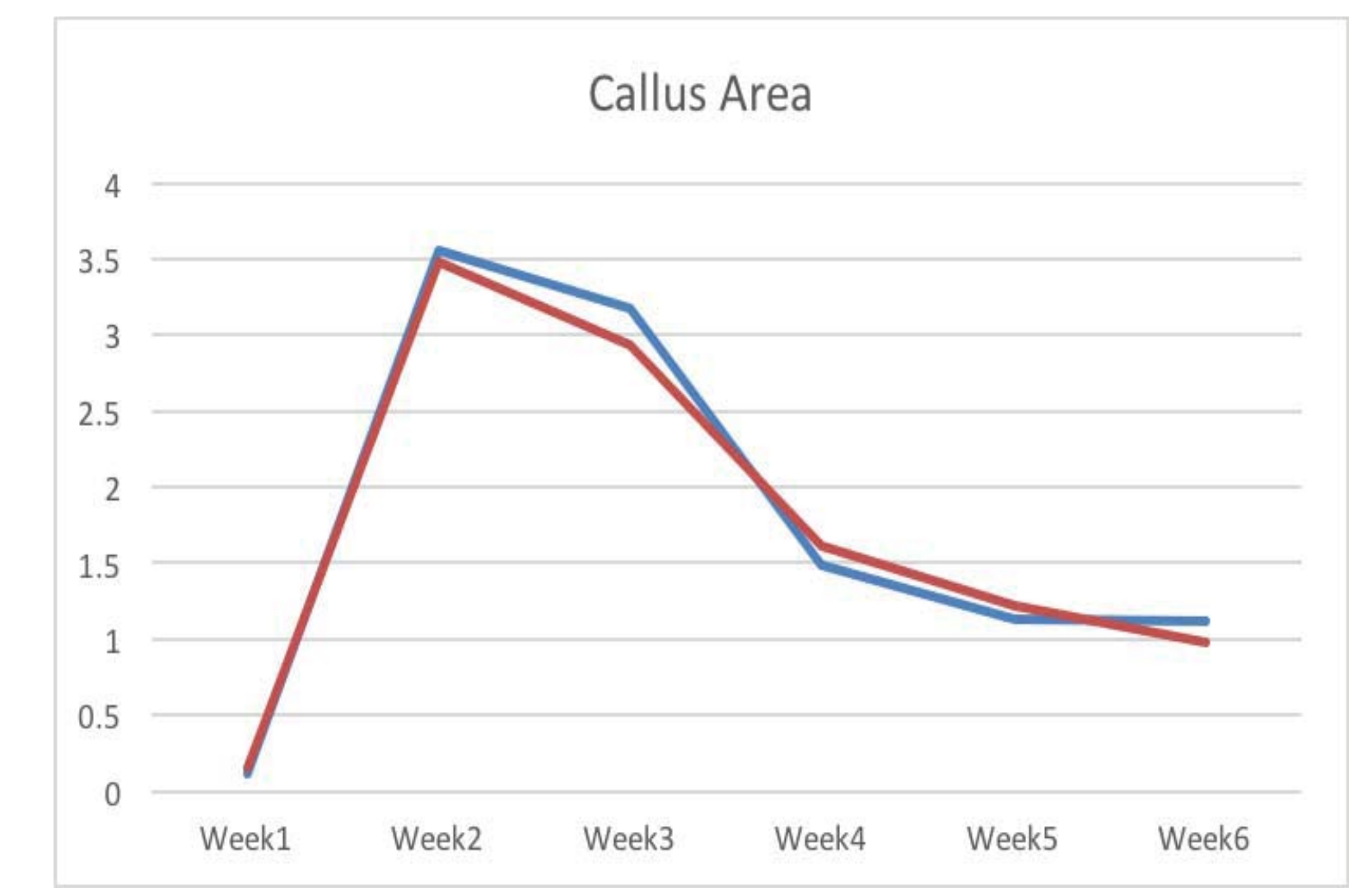
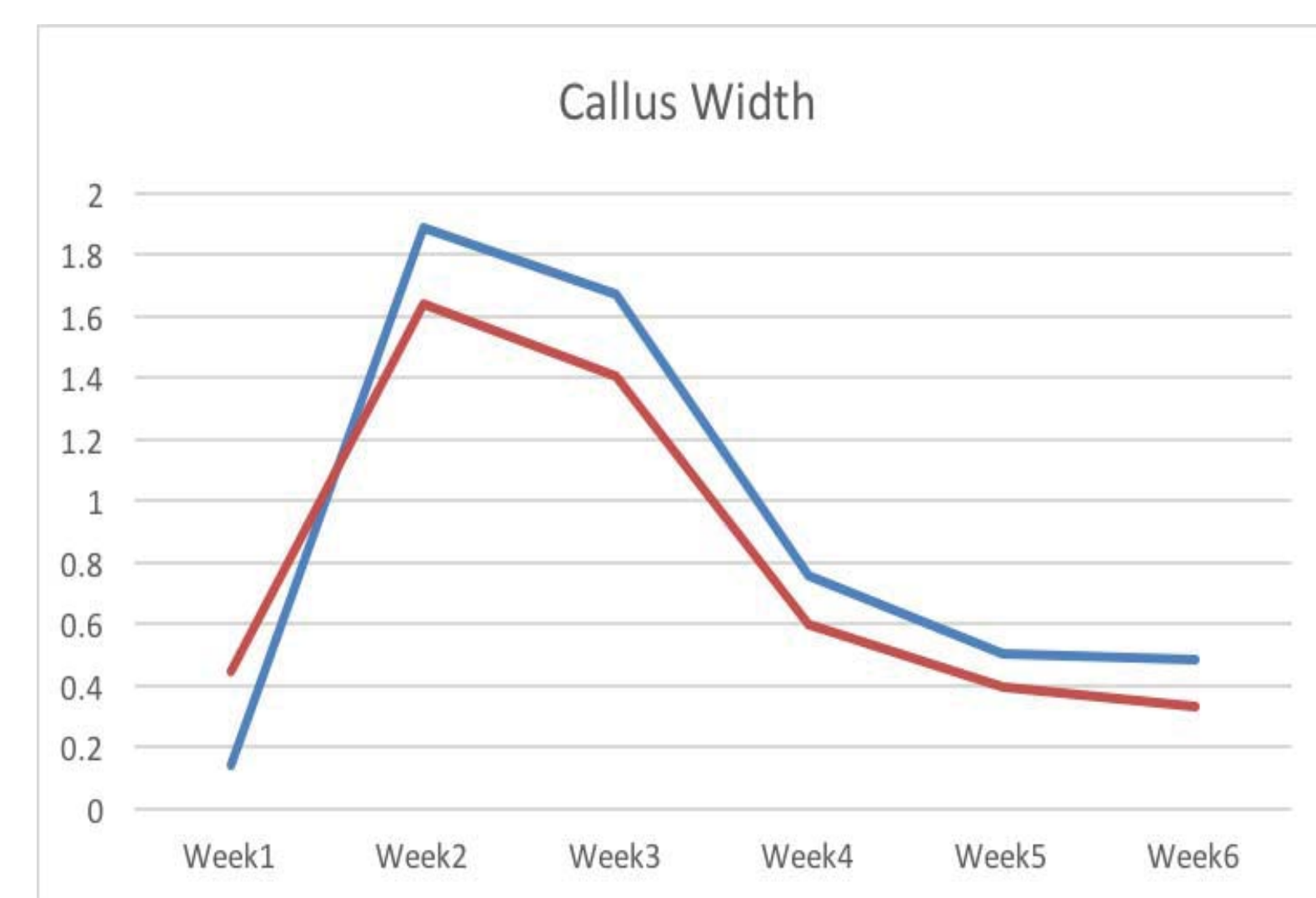
### Radiograph Analysis:



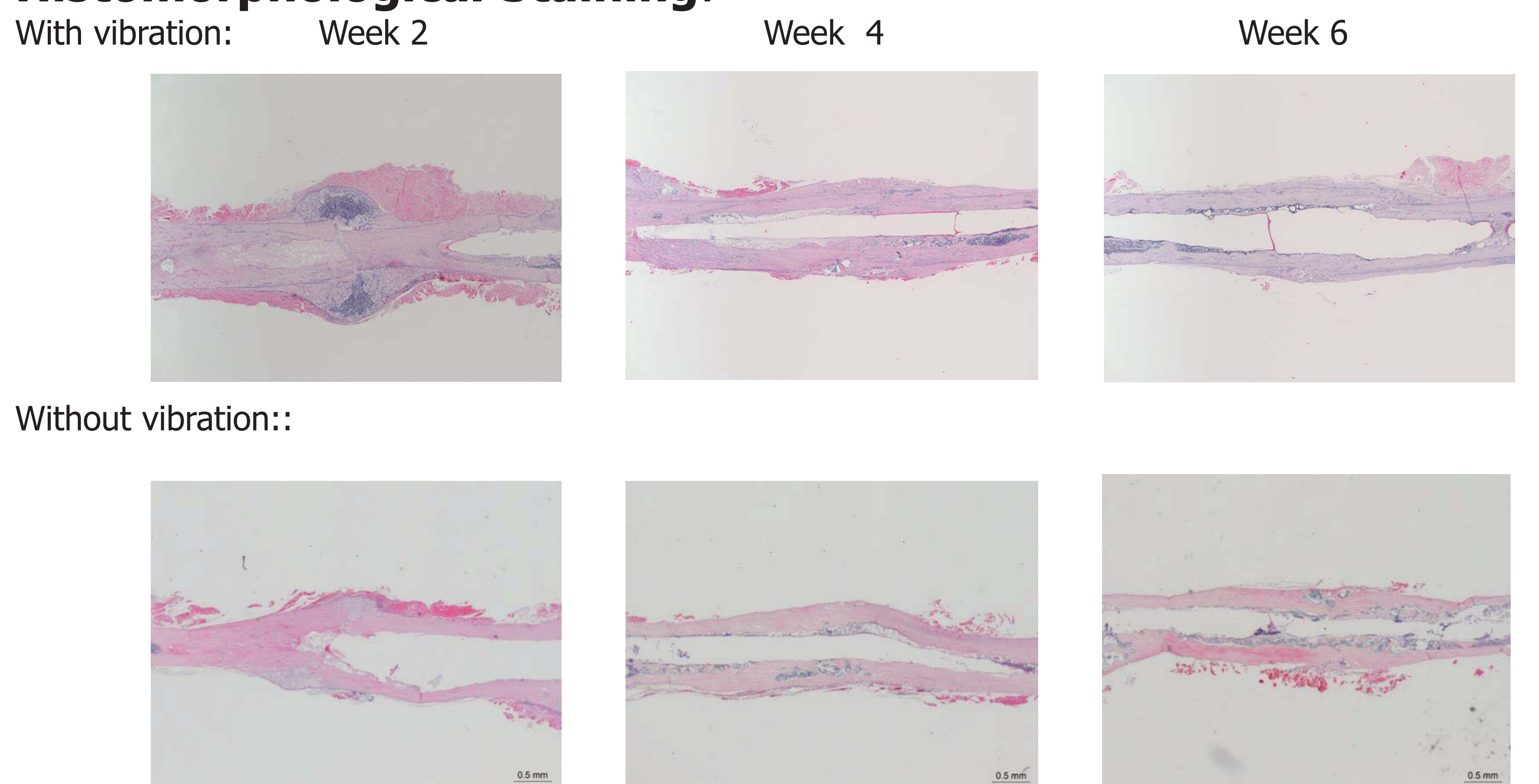
### Callus Width and Area without vibration:



### Callus Width and Area with vibration:



### Histomorphological Staining:



### MicroCT:



In these study, the analysed result has been shown that

- The change of callus width and area with vibration stimulation is larger than that without vibration stimulation between week 3 and week 4.
- The slope between week 3 and week 4 is steeper than that without vibration in such period.
- Image with Sanfranin-O staining has also proven that the callus width and area is dropped with a faster rate with the use of vibration stimulation.
- It is proved that LMHFV has built a positive impact in osteoporotic fracture healing with the presence of sarcopenia.

### Acknowledgements

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### Reference

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