ROLE OF PERIOSTEUM AND BONE MARROW IN LENGTHENING: A QUANTITATIVE STUDY IN RABBITS USING DEXA

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INTRODUCTION: This study values quantitatively the bone formation due to peristeum and/or bone marrow-endosteum in distraction osteogenesis.

MATERIALS AND METHODS: Surgical procedure. One femur of 18 NZW 2.4-3.0 kg rabbits was fitted with a custom-made external fixator.

RESULTS: X-ray evaluation: BM forms bone around the distraction gap.

DISCUSSION: Quantitatively, the P contributes more than the BM. The spatial distribution of the bone formed is different from the combination of periosteum and bone marrow-endosteum in bone osteogenesis.

CONCLUSION: A synergistic effect (spatial and qualitative) may result from the combination of peristeum and bone marrow-endosteum in bone healing.

Table 1. Measurements on the whole specimens (W) and in the 3 central regions (C) in the 4 groups: % increase in area, BMC and BMD for the operated femur / non-oper. femur (mean ± 1 SD).

Table 2. Effects (± α , with probability p) of Periosteum (P), bone marrow (B) and interaction P/BM (PB) on the area, BMC & BMD of the whole specimens (W) and of the 3 central regions of interest, around the distraction gap (C).

Figure 1. PS TKA at 0, 30, 60 and 90 degrees.

Figure 2. Average screwhome values for PCR TKA

Figure 3. Average screwhome values for PS TKA

CONCLUSION: This analysis demonstrates reverse screwhome rotation can occur, most commonly after PCR TKA. This may be related, in part, to abnormal anterior femoral translation during flexion that has been observed in previous in vivo kinematic studies. Reverse screwhome rotation is potentially detrimental, enhancing the risk of patellofemoral instability, and premature polyethylene wear.


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