

P33. Shock wave therapy for osteoinduction

Marianne Koolen¹, Pouran Behdad¹, Saber Amin Yavari¹, Cumhuri Öner¹, Amir Zadpoor², Harrie Weinans¹, Olav Van der Jagt³

Email: mariannekoolen@gmail.com

1. UMC Utrecht
2. Delft University of Technology
3. Elisabeth-TweeSteden Hospital

- Introduction** Bone substitutes can be used if human's capacity for bone regeneration is lacking. We think that shock waves (UESW) can improve bone ingrowth and angiogenesis.
- Material and Method** Three different bone substitutes were implanted in a 6 mm femoral defect in rats: porous tricalcium phosphate (TCP), porous hydroxyapatite (HA) and porous titanium. Femurs were treated twice with 1500 UESW 2 & 4 weeks after implantation and compared with non-treated controls (n=8 per group). Net bone volume changes were analysed using microCT-scanning. With histology angiogenesis and bone ingrowth was examined.
- Results** UESW treated femurs with HA and titanium did have more bone formation during follow-up from 4 to 11 weeks after implantation. The TCP bone substitutes slowly diminished their net volume of calcified matrix during the follow-up period and TCP was insensitive to UESW treatment. Histology confirmed this.
- Discussion** In this study we showed that HA and titanium bone substitutes favour from an extracorporeal shock wave treatment, whereas TCP does not. We speculate that this is related to the mechanical characteristics of the bone substitute as well as the bone resorption induction of the TCP.
- Conclusion** Shock wave therapy might become a useful tool to enhance bone formation in bone substitutes, but further studies are required to unravel the mechanism behind its osteoinductive effects.