

Modulation of physal growth using extra corporeal Shock wave lithotripsy in a rabbit model

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Device and producing company:

OssaTron (SanuWave, Marietta, GA)

Introduction:

Extracorporeal shockwave lithotripsy (ESWL) has the potential to provide a non-invasive modulation of physal growth. The purpose of this investigation is two-fold: 1) to investigate the effects of 3 different dosages of ESWL on the rabbit physis as compared to the control group; 2) to analyze the histological and radiographic change.

Methods:

Thirty female NZW rabbits of 3 weeks of age were used for this experiment. The OssaTron (SanuWave) was used to administer each physis. Each of the three groups received a different treatment of low (0.2 mJ/mm²), medium (0.6 mJ/mm²), and high (1.0 mJ/mm²) dosages. Each rabbit received one administration of 6000 shocks on the right leg. Radiological studies were analyzed quantitatively to monitor growth monthly. At 10 and 18 weeks, five rabbits from each group will be sacrificed and prepared for histological studies.

Results:

There was no significant difference between right and left femur length in X-rays at 2, 10, 14 and 18 weeks (Wilcoxon, $P > 0.05$). Percentage change of right femur vs. left femur showed the greatest discrepancy in lower power group at 2 weeks, but delayed until 10 weeks in both intermediate and high power group. Both intermediate and high power group demonstrated histological changes in the treated side.

Discussion:

Though there was no significant change of femur length in X-rays, there were obvious different trends in the bone growth progress between the treated groups and the untreated groups.

Conclusion:

ESWL with more than 0.6 mJ/mm² power may be able to alter growth in children with growth deformities.