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MECHANICAL PROPERTIES OF BONE GRAFT IRRADIATED AT 11 KGy

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SUMMARY

Risk of infection and disease transmission remain a concern in application of bone allograft in orthopaedic surgery. Terminal sterilization by means of gamma irradiation remain the most practical and widely used method to reduce the risk however, it carries the possibility of weakening of the mechanical properties and study has shown that it is dose-dependent. We studied a lower dose of gamma irradiation at 11 kGy instead of the standard at 25 kGy for sterilization of the allograft. In total, 13 long bones (five femurs and eight tibias) were used. Only the diaphysis was used, and each bone was divided into three equal segments of at least five centimeters in length and put into three groups being the non-radiated group, bone radiated at 11 kGy and another group radiated at 25 kGy. Microbiological testing was done during each step of the process. Based on our study, it shows that bones that were radiated at 11 kGy have better mechanical properties compared to the ones radiated at 25 kGy while keeping the sterilization effect. Thus, we can conclude that bone graft radiated at 11 kGy is feasible and should be considered to be used in bone processing.

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