Analysis of pre-operative administration of denosumab for giant cell tumor of bone

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【Background】RANKL inhibitor denosumab has been shown to be an effective treatment for giant cell tumor of bone (GCTB) and has provided treatment opportunities even for GCTB that was deemed inoperable in the past. The optimum protocol for administration of denosumab has not been conclusive. In this study, clinical outcome of GCTB after denosumab administration was analyzed to elucidate the problems surrounding its treatment.

【Materials and Methods】Since 2011, 18 GCTB patients were treated with denosumab (11 male and 7 female). The average age was 42.8 years (range 16-71), and the median follow up period was 20.8 months (range 4-36 months). There were 8 primary and 10 recurrent lesions. 9 tumors resided in the spine (4 cervical, 1 thoracic, 1 lumbar, 3 sacral), 2 in the radius, 2 in the tibia, and one each in the skull, carpal bone, femur, sternum and humerus. Patients were followed for clinical symptoms and adverse events, and number of denosumab administration, change in radiograph, TRAP-5b and histology were analyzed.

【Results】 Average number of denosumab administration was 20.1 cycles. 4 Patients who underwent subsequent surgery had an average of 10.5 cycles of administration preoperatively and 3.3 after surgery. Average TRAP-5b (mU/dl) decreased from 1226.1 to 76, and all patients experienced significant reduction in pain at the final follow-up. Radiographically, there were 2 PR and 16 SD. Histologically, there were greater than 90 % reduction in number of osteoclast-like giant cells and irregular new bone formation, although mononuclear stroma cells were intact. There were 2 necrosises of the jaw and 1 joint pain upon injection.

【Conclusion】Denosumab has improved the outcome of GCTB drastically in the past few years, but optimum protocol for denosumab administration for GCTB has not been elucidated to date. There are still questions surrounding the amount administered prior to surgery and length of its administration for inoperable cases. Intermittent usage still has no evidence. Due to the many questions surrounding its administration, further prospective studies are needed to refine the treatment for GCTB.