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## Comparison of clinical outcomes by stem desing in reverse shoulder arthroplasty -inlay, onlay, semi-inlay-

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### Introduction and Background

Different types of lateralized stems have been developed for reverse shoulder arthroplasty (RSA). The inlay, originally designed by Grammont, has been replaced by the onlay, but recently the semi-inlay has also been used. In this study, the postoperative outcomes of RSA with different stem types were evaluated.

### Material and Method

The study included 63 patients (20 male, 43 female, mean age at surgery 76.7 years) who underwent inlay, onlay, or semi-inlay RSA and were followed up for more than one year since 2014. The stem types were inlay in 20 patients, onlay in 20 patients, and semi-inlay in 23 patients. Clinical evaluation was performed one year after surgery, and clinical scores, ROM, and muscle strength were compared among the three groups.

### Results

There were no significant differences in preoperative clinical scores, ROM, or muscle strength among the three groups. When comparing preoperative and postoperative values, all clinical scores had improved significantly in all groups. Regarding ROM, flexion and abduction had recovered significantly in all groups, but no significant changes were observed in external rotation and internal rotation in any groups. Regarding muscle strength, abduction strength improved significantly in all groups, but a significant improvement in external rotation strength was only seen in the onlay. When comparing the three groups postoperatively, the external rotation ROM and strength of the onlay were significantly higher than those of the inlay, and only the external rotation ROM of the semi-inlay was significantly higher than that of the inlay.

### Conclusions

In a postoperative comparison, the ROM and muscle strength of external rotation were higher in the onlay than inlay, but even the semi-inlay had a higher external rotation ROM than the inlay. The lateralized humerus result in a deltoid wrapping effect that improves stability and external rotation muscle strength, and good clinical results can be obtained even without excessive lateralization.

