Figure Legends

Figure 1　Implant materials.
Three different types of PS were used in this experiment: standard PS (ST) that had not undergone any surface treatment as control, BL, and HA.

Figure 2　Surgical Procedure.
All PSs were placed independently in each vertebra and not interconnected with rods.

Figure 3　Postoperative X-rays were taken to verify the positions of pedicle screws.
a. AP view.
b. Lateral view.

Figure 4
a. Region of interest (ROI) (1.0mm×1.1mm)
b. Tissue volume (TV): The area except screw thread (vertical line)
c. Bone volume (BV): The area of the bone (horizontal line)
d. Implant surface (IS): The total length of the implant (band with vertical line)
e. Bone surface (BS): The length of bone in contact with the implant (band with horizontal line)

Figure 5　Qualitative analysis of bone-implant interface
a. HAs in 0W Group: trabecular bone around the implant was disrupted and fragmented as a result of fracturing caused by screw insertion.
b. HAs in 2W Group: most of the fragmented bone had been resorbed.
c. HAs in 2W Group (TB staining): the implant surface was covered with bone-lining cells and some of the cells formed woven bone.
d. HAs in 4W Group: newly developed lamellar bone was observed at the BII with direct contact between the bone and the implant.
e. STs in 4W Group: no increase in areas of bone substance was evident in regions adjacent to the implant

Figure 6　Qualitative analysis of bone-implant interface in 24weeks
a. HAs: the formation of lamellar bone in close contact with the implant was apparent.
b. STs: numerous soft tissue interpositions were present in the gaps between the bone and the implants.

c. BLs: there was some formation of lamellar bone.

At locations further away from the implants, fatty marrow conversion associated with osteoporosis was present in all of the samples, with no clear difference among the different types of screws