

Astra Tech and Brånemark System Implants: A Prospective 5-year Comparative Study after One Year

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Products:
Fixture TiOblast 3.5 & 4.0
9-19 mm lengths
UniAbutment 20°

Purpose: The study compared treatment outcome with respect to implant survival, marginal bone levels and other clinical parameters for the Astra Tech and Brånemark systems.

Material and Methods 66 patients included in the study were randomly assigned to the Astra Tech (AG) or Brånemark (BG) groups, 33 patients in each group. 13 patients had hypertension, 5 had controlled diabetes and 18 were smokers (67% in AG and 33% in BG).

104 maxillary and 80 mandibular implants were installed in the AG. Implants were TiOblast, 3.5 mm and 4.0 mm diameter and ranged from 9 to 19 mm in length.

107 maxillary and 80 mandibular implants were installed into the BG. Implants were machine prepared, 3.75 mm in diameter and ranged from 10 to 18 mm in length.

Abutment connection was carried out after similar healing periods for both systems, averaging 6.5 months for maxilla and 3.9 months for the mandible. Operation time was recorded for comparison during both first and second stage surgical procedures.

Prosthetic procedures were conventional and followed routine protocol.

The follow-up parameters recorded were:

1) Presence or absence of pain, 2) Implant stability, 3) Plaque score, 4) Bleeding on probing, 5) Mechanical complications, 6) Changes in marginal bone levels.

Marginal bone levels were measured from established reference points for each system at fixture insertion (FI), abutment connection (AC), baseline (BL) and at the one-year review (OY).

Results 8 implants failed in the BG, 5 in one patient, yielding a 4.3% failure rate. Only 1 implant failed in the AG, yielding a failure rate of 0.5%, ($p < 0.05$).

One bridge was lost in the BG, yielding a 3% prosthetic failure rate.

Plaque accumulation ranged from 0 to 25% and bleeding on probing from 0 to 5% at the one-year follow-up. There was no difference between the systems.

Marginal bone levels for the AG measured 0.1 mm below the reference point at FI, 0.7 mm at AC, 1.4 mm at BL and 1.6 at OY. Respective figures for the BG were 0.1 mm at FI, 0.3 mm at AC, 1.8 mm at BL and 1.9 mm at OY. The overall changes in marginal bone levels were not statistically different between the systems.

Discussion This study compared the Astra Tech TiOblast fixtures and machine prepared Brånemark fixtures. Exposure surgery and abutment connection was simpler in the Astra Tech system, as indicated by a 40% reduction in the time taken to perform this procedure.

Failure rates were significantly lower for the AG compared to the BG, however one patient lost 5 implants in the BG, and thus lost the whole prosthesis. The survival rates at one-year were therefore 99.5% and 95.7% respectively.

Marginal bone changes followed differing patterns with more resorption around the implants in the BG after baseline. This may reflect differing patterns of remodelling around the two systems. At the one year follow-up the mean marginal bone loss was 0.3 mm less for implants in the AG compared with the BG (not significant).

Astra Tech Note: The BG implants have a reference point that is placed deeper in the bone, in reality giving rise to a larger difference in the alteration of marginal bone levels.