Abstract: To investigate the biocompatibility of a synthetic auditory ossicle to host bone, small thin Apaceram® disks composed of dense hydroxyapatite were implanted under the periosteum of the left auditory bulla in 32 rats for periods ranging from 1 day to 270 days. A sham operation performed on 10 rats served as a control. Decalcified histological sections stained with hematoxylin and eosin were observed using light microscopy. The experiment showed: 1) a time-dependent mature fibrous connective tissue surrounding the Apaceram® disk, 2) no evidence of inflammatory reaction caused by the implant from 90 days after implantation until the end of the experiment, 3) no evidence of osteolysis by osteoclasts caused by the implant, and 4) direct contact of bone to the implant on the bone-disk interface at 180 and 270 days after implantation. The findings suggest that Apaceram® has a high degree of implant biocompatibility, making it a satisfactory substitute biomaterial for otological reconstructive surgeries. J. Med. Invest. 47: 56-60, 2000

**Keywords**: hydroxyapatite; auditory bulla bone; implant; biocompatibility; rats
Surgical technique

"MM FYQFSJNFOUBM BOJNBMQSPDFEVSFTXFSF BQQSPWFE BOE NPOJUPSFE CZ UIF *OTUJUVUF PG "OJNBM $BSF BOE 6TF $PNNJUUFF PG UIF 6OJWFSTJUZ PG 5PLVTIJNB BOE QFSGPSNFE BDDPSEJOH UP UIF JOTUJUVUJPOBM HVJEF MJOFT PO UIF DBSF BOE VTF PG MBCPSBUPSZ BOJNBMT UPUBM PG  FJHIUXFFLPME TQFDJGJD QBUIPHFO GSFFGFNBMF 8JTUBS SBUT XFJHIJOH  HSBNT XFSF VTFE 5IJSUZUXP SBUT VOEFSXFOU TVSHJDBM QSP DFEVSFT BT BO JNQMBOU HSPVQ BOE  SBUT VOEFSXFOU TIBN PQFSBUJPOT BT B DPOUSPM HSPVQ 4VSHFSZ XBT DBSSJFE PVU VOEFS HFOFSBM BOFTUIFTJB VTJOH EJFUIZM FUIFS JO TUFSJMF DPOEJUJPOT

Observation method

"O JODJTJPO BQQSPYJNBUFMZ  NN MPOH XBT NBEF NN CFIJOE UIF QPTUFSPTVQFSJPS MFGU BVSJDMF PG FBDI SBU 5IF BVEJUPSZ CVMMB XBT FYQPTFE BOE JUT QFSJPTUFVN XBT TFQBSBUFE UP FYQPTF UIF CPOZ TVS GBDF 5IJT CPOZ TVSGBDF XBT MJHIUMZ TDSBUDIFE VTJOH B TNBMM CMVOU CMBEF UP JOEVDF BO JOKVSZ TJNJMBS UP JOKVSZ JO PUPMPHJDBM SFDPOTUSVDUJWF TVSHFSZ 4DSBUDI JOH XBT NJOJNJFE UP BWPJE GSBDUVSFT PG UIJO CVMMB CPOF 5IF "QBDFSBN

Prepared sections and staining

5IF IFBET PG UIF SBUT XFSF JNNFEJBUFMZ JNNFSTFE JO  QIPTQIBUFCVGGFSFE GPSNBMJO GPS UISFF EBZT 5IFO UIF FBS ESVN XBT QVODUVSFE CZ B OFFEMF (ʷ UP BMMPX EFDBMDJGZJOH TPMVUJPO UP JSSJHBUF UIF NJEEMF FBS BOE UIF BVEJUPSZ CVMMB XJUI UIF TVGGJDJFOUMZ EFDBMDJGJFE XJUI %FDBMDJGZJOH 4PMVUJPO "BEKVTUFE CZ UIF 1BOLM 3ZDIMP NFUIPE 8BLP 1VSF $IFNJDBM 0TBLB "GUFS UISFF EBZT PG EFDBMDJGJDBUJPO UIF BVEJUPSZ CVMMB BOE TVSSPVOEJOH JNQMBOUFE UJTTVF XFSF EJTTFDUFE BOE EFIZESBUFE JO BO FUIBOPM TFSJFT FN CFEEFE JO QBSBGGJO BOE DVU JOUP µ N UIJDL TFDUJPOT

1. Specimens examined within 30 days after surgery

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Reaction of soft collagenous tissue surrounding the implant

2. From 90 days to the end of implantation

Reaction at the bone-implant interface