

Utilization of the Acoustic Emission Technology in Bone Tissues

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ABSTRACT

The main subject of this study was to establish a meaningful significance of the acoustic emission technology to be incorporated in the pedicle screw fixation procedure. Its purpose was to find a replacement technique using the acoustic emission technology instead of keep using the conventional way which only depends on the surgeon's expertise. The experiment of pedicle screw fixation method work was carried out on a goat's vertebrae as a lab scale material instead of the human cervical vertebrae. While the experimental work was done, the acoustic emission signatures were then acquired using the Physical Acoustics acoustic emission data acquisition system. Once completed, the acoustic emission signatures were then analysed using Matlab software together with the AEWIn software package. From the results obtained, the numbers of data counts are generally bigger for the pedicle screw fixation procedure at early stage of bone penetration compared to the latter. It is significant to the different structure of bones as hard bone technically takes more time to be penetrated compared to the soft ones. This technique undoubtedly has high potential to be studied further so that it can be commercialized into the medical field. © (2014) Trans Tech Publications, Switzerland.

KEYWORDS: Acoustic emission; Bone tissue; Fixation procedure; Pedicle screw

DOI: [10.4028/www.scientific.net/AMM.471.218](http://dx.doi.org/10.4028/www.scientific.net/AMM.471.218)