

**Giorgio Iodice**<sup>1</sup>, Bjorn Ludwig<sup>2</sup>, Elena Polishchuk<sup>3</sup>, Roman Polishchuk<sup>3</sup>, <sup>1</sup>Studio Iodice, Caserta, Italy, <sup>2</sup>Private Practice, Traben Trarbach, Germany and <sup>3</sup>Telethon Institute of Genetics and Medicine, Pozzuoli (NA), Italy

**AIMS:** In orthodontics, some miniscrews available commercially are characterized by a specific colour-coding of the screw for visual distinction of length, provided by anodic oxidation. Nevertheless, to date no studies have investigated the influence of anodic oxidation on the cellular viability and growth to the surface of the orthodontic temporary anchorage devices (TADs). Therefore the aim of present study was to investigate on the effects of anodic oxidation of orthodontic TADs on human osteogenic cells viability and growth.

**MATERIALS AND METHOD:** One hundred-twenty 5 mm and thirty two 10 mm titanium grade V disks were used for the experiments. Human osteoblast-like osteosarcoma Saos-2 cell growth was evaluated for 24 hours in two different sections and the number of cells was calculated in eight equal fields of view. Distribution and intensity of procollagen I signal was determined using Zeiss ZEN 2008 and SP1D8 as the antibody. Cell viability was analyzed by the live/dead viability/cytotoxicity assay kit (Thermofiscer). For cell migration assay a culture-Insert-2-Well (IBIDI) was used and monitored for 12, 24, 40 and 48 hours. Data collected were first analyzed by means of conventional descriptive statistics. Pearson product-moment correlation, supplemented by one way analysis of variance for unpaired samples, was used for statistical analysis.

**RESULTS:** The impact of TiO<sub>2</sub> coating resulted to be negatively associated to cell growth. No significant difference in cell death was found among different disks. Greater distribution and amount of procollagen I was found between the control group and TiO<sub>2</sub> covered disks. Finally, cell migration revealed significant differences in ability of cells to repopulate disk surfaces at an early time point. Nevertheless, after 48 hours all discs showed complete repopulation of the gap area.

**CONCLUSION:** Anodic oxidized miniscrews are not toxic for human osteoblast-like cells. Nevertheless, the anodization process of the TAD surface negatively influenced cell adhesion and migration monitored at 12 hours. However, at 48 hours no difference was found between TADs with or without anodic oxidation process.