**A pilot study of a novel Nanocomposites silicon airway stent in two sheep model**

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**Abstract:**

Due to the COVID-19 pandemic in recent years, many patients after extubation had stenosis because of long-term intubation. Therefore, Tracheal stenosis in these Patients is benign and can be treated using silicone stents, and many patients need silicone stents during recovery. This research presents a research pilot to test a newly developed nanocomposite stent. The new stent consists of two constituents; silicone RTV2(matrix) and silica nanoparticles (inclusions). Silica nanoparticles improve resistance and the hydrophobic properties of the stent surface and consequently can decrease plaque mucus in the tubular stent. Both pilot sheep were stented with a new method of stenting. After one month of stenting, two sheep were examined using 3D-virtual bronchoscopy, bronchoscopy and multiple biopsies from the erosion.

**Keywords:** COVID-19 pandemic; Silicone Stent; 3D-virtual bronchoscopy; multiple biopsies; Nanocomposites; hydrophobic silica Nanoparticles