

## **Vibration Response Imaging (VRI™) Technology is a Useful Tool for Assessment of Outcome after Bronchoscopic Intervention**

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### **Purpose:**

Interventional procedures are of increasing importance in bronchology. Gold standards after intervention are widely lacking. Thus neither different methods nor results in different centers can be reliably compared. We explored the VRI™ technology for evaluation of results after bronchoscopic interventions.

### **Methods:**

The 40 sensors of the VRI™ technology pick up the vibrations on the chest wall created by respiration maneuvers. By processing the signals to dynamic gray scale images breathing maneuvers can be followed real time on a monitor. In a prospective study approved by the ethics committee the electronic stethoscope was applied before and after interventions (dilation, laser treatment, stenting etc.) and compared to images of healthy individuals and to results of the gold standards.

### **Results:**

In 32pts the signals differed from 8 healthy persons. After intervention we saw a significant change towards normal, resulting in different patterns by the VRI™ technology depending on site and nature of pathology. The VRI™ technology was successful in 90% (18/20) distal to the trachea. Results could be quantified, even if this was not possible with other methods. Sometimes the VRI™ technology was more reliable in pre-interventional diagnosis of the pathology. Tracheal stenosis showed a typical floating pattern of the VRI™ technology in 70% (7/10). The study is ongoing for more data for general conclusions based on robust statistics for different subsets.

### **Conclusions:**

We observed significant changes in the patterns by the VRI™ technology pre and post intervention. In most cases the changes could be quantified by complex algorithms and thus might serve a more objective quantification of pre and post intervention status.

### **Clinical Implications:**

The VRI™ technology has the potential to quantify results of bronchoscopic interventions. In future, it might be possible to obtain reliable informations on the site and the nature of the airway problem. This might have decisive influence on choosing the best method for intervention.