A COMPUTERIZED TOMOGRAPHY STUDY OF VOCAL TRACT SETTING IN HYPERFUNCTIONAL DYSPHONIA AND IN BELTING

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According to clinical observations the vocal tract setting in hyperfunctional patients is characterized by elevation of the larynx and narrowing of the epilaryngeal and pharyngeal region. Similar observations have been made for various singing styles, especially among non-classical genres, e.g. belting. The voice quality in belting has been described to be loud, speech-like and high-pitched. It is also often described as sounding 'pressed' or 'tense'. The above mentioned has lead to the hypothesis that belting may be strenuous to the vocal folds. On the other hand, singers and teachers of belting do not regard belting as particularly strenuous. This leads to the question what possible similarities and differences there are between hyperfunctional voice production and belting. This study concerns vocal tract setting. Four male patients with hyperfunctional dysphonia and one male pop-singer were registered with computerized tomography (CT) while phonating on [a:]. Patients used speaking pitch, singer used the pitch G4. The scannings were studied in sagittal and transversal dimensions by measuring lengths, widths and areas. According to the results various similarities were found between hyperfunction and belting: high vertical larynx position, small hypopharyngeal width and epilaryngeal outlet and pharyngeal inlet areas. On the other hand, belting differed from dysphonia (in addition to higher pitch) by a wider lip and jaw opening, and larger volumes of the oral cavity. The results show how belting takes advantage of 'megaphone shape' of the vocal tract. A further modeling and simulation study will address sound energy transfer. Next step will also be to compare vocal fold vibration between hyperfunction and belting in order to evaluate the 'price of decibels' in these phonation types.