

Actions of the main laryngeal muscles

Soundtrack of the movies

These clips are taken from a famous movie produced in 1960 at Groningen University medical physics department and physiological laboratory by van den Berg, Vennard, Burger and Shervanian

1. Abduction and Adduction

“When the **posterior cricoarytenoids** contract the arytenoid cartilages are separated, and the space between the vocal folds is large. This space is called the glottis. In breathing the glottis is open. The posterior cricoarytenoids are the chief *abductory* muscles.

The **interarytenoid** muscles on the other hand are *adductory*. When they contract the apexes of the arytenoids are drawn together.”

2. Medial compression

“The **lateral cricoarytenoid** muscles bring the vocal processes toward midline. Here is what happens when they work alone. We see that the lateral cricoarytenoid muscles exert a leverage so that the vocal processes are pressed together. We shall call this *medial compression*.

But to close the glottis completely we must contract both the lateral cricoarytenoid muscles and the interarytenoid muscles.”

3. Longitudinal tension

“When the **thyroarytenoid** muscles contract they reduce the distance between the angle of the thyroid and the arytenoid cartilages, and the vocal ligaments are slackened.

On the other hand, when the thyroid moves forward away from the arytenoids the vocal folds are stretched. It is the **cricothyroid** muscles that do this. This action stretches the vocal folds. We will shall it *longitudinal tension*. We might expect longitudinal tension to close the glottis, but instead there appears a narrow opening even though the interarytenoid muscles are contracting. Adequate medial compression will close this chink.”

4. “Arytenoids”

(The final clip shows the positioning of the arytenoids by means of actions of posterior cricoarytenoid, lateral cricoarytenoid and interarytenoid from a slightly different perspective. It is actually roughly the view that would be seen in a laryngeal mirror, but looks unusual because the thyroid has been removed from the specimen)

“We observe the movements of the arytenoids as each pair of muscles contracts and exerts its pull.

The posterior cricoarytenoid muscles separate the arytenoids with a rocking motion, and the interarytenoids draw them together again with a rocking and upward gliding movement so that the apexes meet.

The lateral cricoarytenoid muscles do this: rocking and gliding. The gliding movement may have a rotating component around the upper or lower corners of the cricoid facet.

We note that the muscular processes are drawn forward, and the vocal processes contact each other.

When both the laterals and the interarytenoids contract there is firm contact between the arytenoid cartilages, like this.”