

# Delayed Complication of Radiotherapy: Laryngeal Fibrosis and Bilateral Vocal Cord Immobility

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## Summary

Radiotherapy is the accepted treatment for early laryngeal carcinomas with the advantage of voice preservation. It is however, not without complications. We report a case of bilateral vocal cord immobility 15 years after radiotherapy. This appears to be due to ankylosis of cricoarytenoid joint and fibrosis of the larynx.

**Key Words:** Radiotherapy, Vocal cord immobility, Delayed complication

## Case Report

A 77 year old gentleman was referred to our department with history of stridor and hoarseness of voice of two months duration. He was diagnosed to have carcinoma of larynx in another center 15 years ago and was successfully treated with radiotherapy. He was not able to provide more information regarding the staging or duration of radiotherapy.

On examination, he had a minimal inspiratory stridor which was marked on exertion. He was to able to speak but unable to complete a full sentence. Fiberoptic examination revealed both vocal cords in the median position with a narrow glottic chink. No mass or growth was noted. Other examinations and investigations were essentially normal. There was no evidence of rheumatoid arthritis, gout or other forms of arthritis in this patient.

He underwent a tracheostomy under local anaesthesia and subsequent direct laryngoscopy. During tracheostomy, his tissue planes in the neck were noted to be fibrosed. Direct laryngoscopy revealed narrow laryngeal inlet and both cords appeared fixed in the paramedian position with a very narrow glottic chink.

The mucosa of the larynx was pale and fibrosed. The arytenoids appeared hard and fixed on palpation. The cricoarytenoid joint was immobile bilaterally. The laryngeal framework; ary-epiglottic fold, ventricles and false cords were firm and fibrosed. No tumor recurrence was noted. Multiple biopsies were taken and were reported as dysplasia of mucosa and submucosal fibrosis. The subglottic space and trachea were essentially normal. CT scan of the larynx showed symmetrical narrowing of the laryngeal vestibule with soft tissue and no definitive mass in the larynx. Repeat direct laryngoscopy was performed 3 months and 6 months later. The findings were the same. The patient was given the option of laser cordectomy where his voice might deteriorate but would be able to breathe without tracheostomy tube. He preferred to keep his voice with a speaking valve tracheostomy tube.

## Discussion

Carcinoma of larynx, in early stages responds quite well to radiotherapy with the advantage of preserving voice and speech. Advanced stages are usually treated with a combination of surgery and radiotherapy.

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## CASE REPORT

Bilateral immobility of the vocal cords is commonly due to abductor palsy of vocal cord caused by the paralysis of the recurrent laryngeal nerves<sup>1</sup>. Recurrent laryngeal nerve palsy presents with changes in voice and stridor. The vocal cords are usually in the paramedian position. Most of the underlying lesions are iatrogenic, with thyroid surgery as the single most important cause. Occasionally it is seen in peripheral neuritis<sup>1</sup>. Bilateral vocal cord immobility can also be due to paralysis of the laryngeal muscles or fixation of cricoarytenoid joint. Cricothyroid joint fixation occurs in cricoarytenoid arthritis secondary to rheumatoid arthritis, gout and ankylosing spondylitis<sup>2</sup>.

Complications of radiotherapy to the head and neck region are well documented. They include mucositis, skin reactions, decreased salivary function, soft tissue fibrosis and perichondritis of larynx<sup>3</sup>. These complications are usually evident within a few months after treatment. Complications that present after many years are rather unusual. As mentioned before, vocal cord in the paramedian position can occur due to recurrent laryngeal nerve palsy, involvement of cricoarytenoid joint or laryngeal muscle involvement. It is important for the clinician to confirm the exact

cause of the paramedian fixation of the vocal cords. In recurrent laryngeal nerve palsies there would still be adducting movements of the vocal cords due to the innervation of the superior laryngeal nerve. In paralysis of the vocalis muscle, the cords would appear thin and wasted. In cricoarytenoid joint fixation, the joints would be ankylosed and fixed during palpation as was noted in this patient. Bilateral recurrent laryngeal nerve palsy after radiotherapy is unlikely after 15 years.

The other possibility would be fibrosis of the abductor component of laryngeal muscle and since it consists of larger bulk than adductor muscles, this would explain the paramedian position in accordance with the Semon's law. Whether the fibrosis of the muscles predisposed to ankylosis of the cricoarytenoid joint or vice-versa is debatable.

It is suggested that radiotherapy may have induced the cricoarytenoid ankylosis and laryngeal fibrosis in this patient. We have ruled out other systemic forms of ankylosis or arthritis. Thus, clinicians should be aware of this possibility even many years after the initial treatment.

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## References

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