

Radiation Induced Trismus

Head & Neck Cancer

Trismus is a serious side-effect of head and neck cancer surgery and radiation therapy, with long-lasting medical implications for the patient. Trismus is often not diagnosed until it is so severe that patients cannot use a fork or spoon, which can be too late to fully treat and can severely restrict the patients treatment and quality of life.

Incidence:

35-55% of Patients Develop Trismus¹

- Higher Risk: Oro- and Para-pharyngeal cancers, masseter and pterygoid muscles irradiated (up to 73%).
- Lower Risk: Laryngeal and Nasopharyngeal cancers

Increased radiation increases chance of Trismus

- Steep increased risk with increased dosage.
- Steep increase on second round of radiation.

Radiation effects on oral tissues:

- Fibrin deposition and collagen formation.
- Radiation Fibrosis and Stiffening.

Radiation in salivary tissues:

- Severely reduced saliva after small doses.

Joint Function & Trismus:

Definition: Any restriction in mouth opening, often caused by infection, trauma, surgery, or radiation

Synonyms: Jaw hypomobility, restricted opening, limited range-of-motion (ROM), lockjaw

MIO/D: Maximum Intercisal Opening/Distance

ROM: Range-of-Motion

Normal MIO: Men 50-60mm Women 45-55mm

Trismus: Decreased function of less than 30-35mm MIO.

Basic Diagnostic - The 3-Finger Test:

Insert Tips of index, middle and ring fingers non-dominant hand between front teeth.

Normal MIO	>40 mm	3+ Fingers
Mild Trismus	30-40 mm	2-3 Fingers
Moderate Trismus	15-30 mm	1-2 Fingers
Severe Trismus	<15 mm	<1 Finger

<u>Progression:</u>	Radiation	Post-Radiation			
Time	During Therapy	1-3 Months	3-12 months	12-24 Months	24-48 Months
Loss	Emergent	Dramatic	Slowing	Continued	Minor
Average MIO Loss ²	3-4%	20+%		2-3%	1-2%



Complications of Radiation Induced Fibrosis and Trismus: ³

- Reduced Oral Hygiene and Saliva promote dental decay and integrity of mandible.
- Disruption of Cancer Treatments
- Compromised Airway, Aspiration
- Reduced Quality of Life:
 - Voice, Speech problems (68%)
 - Difficulty Sneezing, Laughing
 - Reduced social interaction
 - Dysphagia, Eating, drinking (65-73%)
- Malnutrition and Dehydration
- Reduced Oral Access, for:
 - Dentures/Prosthetics
 - Dental Procedures
 - Medical Procedures, Intubation
- Joint Immobilization (oral cancer 73%):
 - Muscle contracture and atrophy
 - Muscle and joint degradation
 - Inflammation, pain, fatigability.

Prevention and Treatment:

Prevention: Trismus can be very difficult to treat, especially when caused by radiation. Preventing its development is imperative for the long-term functionality and quality of the patients recovery.

- Therapy and stretching are less effective in treating radiation induced trismus after it has occurred.
- Trismus (<35mm MIO) at discharge of radiation therapy is strong predictor of trismus at 6 months.
- Preventative early rehabilitation can reduce incidence (by 40%) and severity (by 60%) of trismus ⁴.

Treatment: Therapies generally include self-exercise, massage, tongue depressors, and jaw motion rehab devices.

- Jaw motion rehab devices (**OraStretch®** press, TheraBite) are 40-60% more effective in treating trismus.⁵

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