

Osteoradionecrosis after Childhood Cancer

What is osteoradionecrosis?

Osteoradionecrosis (ORN) is a problem with bone healing that can occur in people who received high doses of radiation, particularly to the jaw. This complication can occur after dental surgery or extraction of teeth. High doses of radiation can decrease the bone's blood supply. If this happens, the bone gets less oxygen than it needs, resulting in the death (necrosis) of bone tissue. The most commonly affected bone is the jawbone (mandible).

Who is at risk for osteoradionecrosis?

Survivors who received high doses of radiation to the jaw area (40 Gy or 4000 cGy/rads or higher) are at risk for this complication. Radiation fields that often include the jawbone are as follows:

- Cranial (head/brain)
- Nasopharyngeal (area above the roof of the mouth)
- Oropharyngeal (mouth and throat)
- Neck or spine ("cervical" portion)
- Supraclavicular (area above the collarbones)
- Mantle or mini-mantle (neck/underarm/chest areas)

It is important to obtain your medical records so that you know exactly how much radiation you received and where the radiation was directed. For example, survivors exposed to radiation doses of 50 Gy or higher to the jawbone have the highest risk for the development of ORN.

When does osteoradionecrosis occur?

Although it is uncommon, ORN most often occurs when a survivor undergoes a dental procedure (such as pulling of tooth) or other surgery involving the jawbone.

What are the symptoms of osteoradionecrosis?

Symptoms of ORN may occur months to years after radiation. Common symptoms include mouth pain, jaw swelling and difficulty opening the mouth fully (trismus).

How is osteoradionecrosis diagnosed?

ORN can be diagnosed by physical examination and imaging studies (x-ray, CT scan and/or MRI). Sometimes, a surgeon may need to take a sample (biopsy) of the problem area in order to make a definite diagnosis. Radiation therapy records should be reviewed to determine the location and dose of radiation that was given.

How is osteoradionecrosis treated?

Treatment of ORN is mainly through control of uncomfortable symptoms. Salt-water rinses and light scrubbing of affected tissues may be helpful. Antibiotics may help if a wound becomes infected. Hyperbaric oxygen therapy (oxygen delivered in a pressurized chamber) is sometimes used to increase the amount of oxygen given to the affected tissues and improve the chance of healing.

Is there anything I can do to prevent osteoradionecrosis?

People who received radiotherapy involving the jaw should:

- Tell their dentist that they received radiation. The dentist will then be able to get details about the radiation treatment before doing any tooth extractions that could lead to ORN.
- Have regular dental care and take good care of their teeth and gums, since the risk for cavities is higher in people who received large doses of radiation. The dentist may order daily fluoride treatments to reduce the risk of cavities and the need for extracting teeth in the future. (See related Health Link: “Dental Health”)

Resources

- The Oral Cancer Foundation
3419 Via Lido #205, Newport Beach, CA 92663
Phone 949-723-4400
Web: <http://www.oralcancerfoundation.org/complications/osteoradionecrosis.php>

Written by Arnold Paulino, MD, Division of Radiation Oncology, MD Anderson Cancer Center, Houston, Texas.

Reviewed by Jacqueline Casillas, MD; Wendy Landier, RN, PhD, CPNP CPON®; and Joan Darling, PhD.

Additional health information for childhood cancer survivors is available at
www.survivorshipguidelines.org

Note: Throughout this *Health Links* series, the term “childhood cancer” is used to designate pediatric cancers that may occur during childhood, adolescence, or young adulthood. Health Links are designed to provide health information for survivors of pediatric cancer, regardless of whether the cancer occurred during childhood, adolescence, or young adulthood.

Disclaimer and Notice of Proprietary Rights

Introduction to Late Effects Guidelines and Health Links: *The Long-Term Follow-Up Guidelines for Survivors of Childhood, Adolescent, and Young Adult Cancers* and accompanying *Health Links* were developed by the Children's Oncology Group as a collaborative effort of the Late Effects Committee and Nursing Discipline and are maintained and updated by the Children's Oncology Group's Long-Term Follow-Up Guidelines Core Committee and its associated Task Forces.

To cancer patients (if children, their parents or legal guardians): Please seek the advice of a physician or other qualified health provider with any questions you may have regarding a medical condition and do not rely on the Informational Content. The Children's Oncology Group is a research organization and does not provide individualized medical care or treatment.

To physicians and other healthcare providers: The Informational Content is not intended to replace your independent clinical judgment, medical advice, or to exclude other legitimate criteria for screening, health counseling, or intervention for specific complications of childhood cancer treatment. Neither is the Informational Content intended to exclude other reasonable alternative follow-up procedures. The Informational Content is provided as a courtesy, but not intended as a sole source of guidance in the evaluation of childhood cancer survivors. The Children's Oncology Group recognizes that specific patient care decisions are the prerogative of the patient, family, and healthcare provider.

No endorsement of any specific tests, products, or procedures is made by Informational Content, the Children's Oncology Group, or affiliated party or member of the Children's Oncology Group.

No Claim to Accuracy or Completeness: While the Children's Oncology Group has made every attempt to assure that the Informational Content is accurate and complete as of the date of publication, no warranty or representation, express or implied, is made as to the accuracy, reliability, completeness, relevance, or timeliness of such Informational Content.

No Liability on Part of Children's Oncology Group and Related Parties/Agreement to Indemnify and Hold Harmless the Children's Oncology Group and Related Parties: No liability is assumed by the Children's Oncology Group or any affiliated party or member thereof for damage resulting from the use, review, or access of the Informational Content. You agree to the following terms of indemnification: (i) “Indemnified Parties” include authors and contributors to the Informational Content, all officers, directors, representatives, employees, agents, and members of the Children's Oncology Group and affiliated organizations; (ii) by using, reviewing, or accessing the Informational Content, you agree, at your own expense, to indemnify, defend and hold harmless Indemnified Parties from any and all losses, liabilities, or damages (including attorneys' fees and costs) resulting from any and all claims, causes of action, suits, proceedings, or demands related to or arising out of use, review or access of the Informational Content.

Proprietary Rights: The Informational Content is subject to protection under the copyright law and other intellectual property law in the United States and worldwide. The Children's Oncology Group retains exclusive copyright and other right, title, and interest to the Informational Content and claims all intellectual property rights available under law. You hereby agree to help the Children's Oncology Group secure all copyright and intellectual property rights for the benefit of the Children's Oncology Group by taking additional action at a later time, action which could include signing consents and legal documents and limiting dissemination or reproduction of Informational Content.