

characterized by down regulation in energy utilization, attenuated level of contractile function, upregulation of stress proteins, cardiomyocyte dedifferentiation and by myocyte remodeling. Morphologically, chronic hypoperfusion results in loss of myofilaments, increased amount of glycogen and small dark mitochondria, typical signs of *hibernating* myocardium.

Protection of normal tissue against radiation-induced damage may increase the therapeutic benefit of radiotherapy. Different more or less effective measures to prevent radiation-induced injury and to increase cardiovascular tolerance to irradiation of healthy tissue have been evaluated. Further investigation is needed to determine the most effective prevention of radiation injury to healthy tissues accidentally targeted by radiation.

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SURGICAL COLLABORATION WITH SEMIPALATINSK (KAZAKHSTAN) AND NAGASAKI (JAPAN) FOR 10 YEAR EXPERIENCE

Abstract:

Background: From 1949 to 1989, 456 nuclear tests were conducted by the former Soviet Union at the Semipalatinsk Nuclear Test Site (SNTS) in Kazakhstan. Exposure was primarily from the first test in August 1949, that affected the northern Semipalatinsk regions, a plutonium bomb in 1951, and a thermonuclear-bomb test in 1953, that affected the Semipalatinsk region southeast of the SNTS. A noticeable increase in the number of cases of Hashimoto's thyroiditis and thyroid cancer were reported. It is very important to assess the clinical behavior of thyroid cancer which may be affected by SNTS in the control of an accurate diagnosis and standardized surgery. We have collaborated with the Semipalatinsk Oncology Center since 1999, in order to establish an optimal method to diagnose and perform a thyroidectomy and a lymph node dissection for the patients with papillary thyroid cancer that is better suited for the Semipalatinsk environmental effects. Every year, SM visited Semipalatinsk Oncology Center from 1999 to 2009 to have some lectures and operations with local physicians and surgeons.

Objective: To assess the change of diagnostic accuracy and thyroid surgery from 1999 to 2009 in Semipalatinsk Oncology Center in collaboration with Nagasaki University and Nagasaki Medical Center.

Material: A total of 169 patients with thyroid cancer who underwent thyroid surgery at the Semipalatinsk Oncology Center were evaluated. From the 169 patients, 125 patients with papillary thyroid cancer were assessed for surgical procedure.

Method: This was a cross-sectional observational study.

Results:

1. Before 2001, there were few preoperatively diagnosed thyroid cancers and from 2002, preoperatively diagnosed papillary cancers increased.

2. From 1999 to 2001, there were no thyroid surgeries with cervical lymph node dissections. The partial lobectomies were mainly performed until 2001. From 2002, total lobectomies were chosen for the majority of the patients, but total thyroidectomies were rarely performed. The lymph node dissection was added occasionally, but rarely.

Conclusion: The optical method to diagnose thyroid tumor was performed, and an accurate diagnosis of thyroid cancer changed the surgical procedure during the period of this study. An accurate diagnosis and standardized surgery for thyroid cancer helped to evaluate the biological characteristics of thyroid cancer which may be affected by SNTS in next decade.

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NANOPARTICLE ENHANCED X-RAY THERAPY OF CANCER

Abstract. Nanomedicine is the use of nanoparticles in medical practice, and can refer both to classical procedures improved using nanoparticles or entirely new techniques developed to exploit certain nanoparticle behaviors in the body. Nanophotothermolysis and nanophotothermia are two new techniques which exploit the strong light absorption properties of nanoparticles to generate heat in a small localized region. Conjugating nanoparticles with various biomolecules allows for targeted delivery to specific

tissues or even specific cells, cancerous cells being of particular interest. Previous studies have investigated nanoparticles at visible and infrared wavelengths where surface plasmon resonance leads to unique absorption characteristics. However, issues such as poor penetration depth of the visible light through biological tissues limits the effectiveness of delivery by noninvasive means. In other news, various nanoparticles have been investigated as contrast agents for traditional X-ray procedures, utilizing the