

Hyperbaric Medical Center

1. Staffs

Center Chief and Junior Associate Professor

Kazuyoshi YAGISHITA

Assistant Professor (Orthopaedic Surgery)

Tsuyoshi KATO

Medical Staff

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Tokunin Assistant Professor

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Researcher

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Professor Emeritus

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2. Purpose of Education

Hyperbaric oxygen therapy (HBO), which can dissolve oxygen in serum in population to atomic pressure and transport oxygen to ischemic tissue, is an established therapy for treatment of several conditions, including decompression illness, carbon monoxide poisoning, acute anterior disturbance, and peripheral ischemic disease. The mechanism of HBO can be described as hyperoxygenation in ischemic soft tissues, reduction of edema, stimulation of fibroblast proliferation and differentiation, increased collagen formation and cross-linking, angiogenesis, and improved preservation of energy metabolism.

This curious treatment has clinically many kinds of efficacy, however, the mechanism of the effect has not been fully understood, and many researchers in the world still attempt to reveal the mechanism of the effect of HBO.

This HBO can stimulate the interest of medical students, basic researchers, and clinical doctors, and this hyperbaric medical center can provide opportunities to study hyperbaric oxygen therapy field.

3. Research Subjects

- 1) Diving medicine
- 2) Soft tissue injuries related with sports activities
- 3) Oxidative stress
- 4) Hyperbaric oxygen therapy

4. Clinical Services

Hyperbaric Medical Center in Tokyo Medical and Dental University hospital is the center institute of hyperbaric oxygen therapy and research in Japan, and one of the largest hyperbaric oxygen chamber in the world is set up in Hyperbaric Medical Center, which can contain the maximum number of 16 persons.

As described above, HBO is applied for several conditions, including decompression illness, carbon monoxide poisoning, acute arterial disturbance, and peripheral ischemic disease. In 2010, 5484 times hyperbaric oxygen therapy (HBO) in 633 patients were performed in our university hospital, which is the most patients number in one institute in a year in Japan. In addition, for the purpose of rapid recovery, we now perform HBO aggressively for soft tissue injury related with sports activities including compartment syndrome, ankle sprain, knee ligament injury

5. Publication

Original articles

- 1) Sekiya I, Morito T, Hara K, Yamazaki J, Ju YJ, Yagishita K, Mochizuki T, Tsuji K, Muneta T. Ketoprofen Absorption by Muscle and Tendon after Topical or Oral Administration in Patients Undergoing Anterior Cruciate Ligament Reconstruction. *AAPS Pharm Sci Tech*. Mar;11(1):154-8, 2010.
- 2) Muneta T, Hara K, Ju YJ, Mochizuki T, Morito T, Yagishita K, Sekiya I. Revision anterior cruciate ligament reconstruction by double-bundle technique using multi-strand semitendinosus tendon. *Arthroscopy*. 2010 Jun;26(6):769-81, 2010.
- 3) Yamazaki J, Muneta T, Koga H, Sekiya I, Ju YJ, Morito T, Yagishita K. Radiographic description of femoral tunnel placement expressed as intercondylar clock time in double-bundle anterior cruciate ligament reconstruction. *Knee Surg Sports Traumatol Arthrosc*. 2010 Aug 24 (ahead of print)
- 4) Ohno K, Noguchi Y, Kawashima Y, Yagishita K, Kitamura K. Secondary hyperbaric oxygen therapy for idiopathic sudden sensorineural hearing loss in the subacute and chronic phases. *J Med Dent Sci*, 57(2):1-6, 2010.