

## Intravascular Holmium Injection To Advanced HCC patients

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Approximately 80% of the patients with hepatocellular carcinoma (HCC) are initially presented with an advanced stage of disease of which surgical treatment is impossible, and these patients have been dependent on hepatic artery embolization or intra-arterial chemotherapy until now. The limitation of these therapeutic modalities is that it is not a fundamental treatment and it also requires regular hospitalization. The mean survival is known as only 6 to 10 months

Severance Hospital, has developed a new concept of treatment for HCC which differs from previous methods of treatments. We have been injecting Holmium(Milican®, Dong Wha Pharm.) into small HCCs of less than 3cm in diameter by guidance of ultrasonography, and the remission rate was 84%. On the basis of this method, we injected Holmium into the feeding hepatic artery in advanced stage HCCs and induced complete remission. The main principle of the method is that the Holmium-Chitosan complex is precipitated only in the tumor and this is possible by a special technique employed to this procedure. The mechanism of the precipitation of the Holmium-Chitosan complex in the liver was discovered incidentally in the laboratory by observing the precipitation with a change in the acidity of this substance.

Basic research on mouse confirmed safety and thus was applied clinically. The Holmium-Chitosan complex is infused into the tumor feeding hepatic artery and immediately the acidity of this lesion is abruptly deranged to over pH 8.0 which will allow the Holmium to distribute to the tumor evenly and start its action of tumor necrosis. The half life of Holmium is 26.8 hours and after 6 days less than 1% of the radioactive substance will be left in the body. And, after the procedure, the urine acidity should be kept over pH 7.0 for 24 hours, and the Holmium-Chitosan complex will stay in the hepatoma. Pharmacokinetic evaluation of the blood level of radiation was done and revealed that the amount of radiation from this procedure (mean 129.71 mCi, n=7) was no greater than the amount of radiation from ultrasonography guided Holmium therapy(mean 29.75 mCi, n=8) which was another insurance for the safety of this treatment