

### 3. Sequential <sup>99m</sup>Tc-MDP Bone Scans in Asymptomatic Patients after Cementless Total Hip Replacement

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This prospective study is to clarify the distribution and degree of radioactivity on sequential <sup>99m</sup>Tc-MDP scans after cementless THR in asymptomatic patients; in order to detect abnormal uptake and to avoid false positive results.

A total of 112 <sup>99m</sup>Tc-MDP scans were performed in 45 asymptomatic patients after cementless THR. Anterior images in the neutral, frog-leg lateral, and lateral images were obtained. Periprosthetic areas about the femoral stem were divided into 5 different zones using the modified Gruen's criteria. The radioactivity of each zone was recorded according to a 5-point grading system. We then analyzed the regression of radioactivity of each zone according to the time intervals.

The radioactivity had lowered from a grade 5 to grade 1 or 2 in the zone of 2 and 4 within 12 months after surgery. However, zone 1, 3, and 5 showed radioactivity of grade 3 or more in approximately 40% of patients more than 16 months after cementless THR.

The changes of radioactivity was related with the time intervals after surgery, as well as a various bone reaction in each periprosthetic zone. Thus, it is beneficial to perform bone scans in approximately 12 months after surgery. Also, sequential follow up of the base-line study is greatly recommend.

### 4. 교차소뇌해리에서 아세타졸아마이드가 소뇌혈류에 미치는 효과

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대뇌반구 경색증 환자의 약 50%에서 반대쪽 소뇌의 혈류 및 대사 저하가 관찰되는데(교차소뇌해리: crossed cerebellar diaschisis), 이는 피질뇌교소뇌로(corticopontocerebellar tract)의 차단에 의한 뉴우런 억제에 기인하는 것으로 알려져 있다. 한편 뇌혈관확장제인 아세타졸아마이드(acetazolamide)에 대한 뇌혈류 반응을 관찰함으로써 혈관예비능(vascular reserve)을 평가할 수 있다. 교차소뇌해리가 발생한 소뇌의 혈관예비능에 관해서는 아직 충분히 연구되어 있지 않다.

교차소뇌해리에서 아세타졸아마이드가 소뇌혈류에 미치는 효과, 즉 해리가 발생한 소뇌의 혈관예비능을 평가하기 위하여 교차소뇌해리가 증명된 일측성 대뇌반구 경색증 또는 뇌질내출혈 환자 8명[54±21세(평균±표준편차), 남자 5명, 여자 3명]을 대상으로 아세타졸아마이드 1.0g을 정맥주사한 후 <sup>99m</sup>Tc-HMPAO SPECT를 시행하고, 소뇌방사능의 비대칭지표(cerebellar asymmetry index, AIcbl) [(경색과 같은 쪽 소뇌방사능-반대쪽 소뇌방사능)/같은 쪽 소뇌방사능×100(%)]를 구하여 안정상태의 그것과 비교하였다. 뇌졸중 발생과 SPECT 검사의 시간 간격은 25~904일이었다.

아세타졸아마이드 투여 후 AIcbl(8.7±6.6, 평균±표준편차)은 안정상태의 그것(17.7±5.8)에 비해 유의하게 감소하였다(p<0.05). 아세타졸아마이드 투여 후 AIcbl의 감소 정도(안정상태의 AIcbl과 아세타졸아마이드 투여 후 AIcbl의 절대적 차이 및 안정상태의 AIcbl에 대한 % 감소)와 뇌졸중 발생 후 경과된 시간 사이에는 유의한 상관관계가 없었다. 이와 같은 성적은 교차소뇌해리가 발생한 소뇌의 혈관예비능은 손상되어 있지 않음을 나타내며, 교차소뇌해리에서 나타나는 소

뇌혈류의 저하는 기능적 불활성화 및 이에 따른 경뉴우런 변성(transneuronal degeneration)에 의해 이차적으로 발생함을 시사한다.

## 5. The Effect of Naloxone on the Size of Cerebral Infarction and the rCBF in Focal Cerebral Ischemia of Rats

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To evaluate the effect of naloxone on the focal cerebral ischemia, focal cerebral ischemia of rat was induced by an occlusion of middle cerebral artery (MCAO) and the size of infarction & rCBFs were measured at 24 hours after left MCAO. The experimental groups were divided into a control (saline-treated) and naloxone-treated (low-dose and high-dose) groups. The rats were given 1 mg/kg iv (low-dose), 4 mg/kg iv (high-dose) of naloxone 30 min before MCAO and then infused continuously at rates of 0.5 mg/kg/hr (low-dose) and 2 mg/kg/hr (high-dose) over next 1 hour by an infusion pump. Coronal sections (20  $\mu$ m-thick) of the rat brain were stained by 2% 2, 3, 5-triphenyltetrazolium chloride solution and the size of infarction was measured by planimeter. rCBFs were measured by an autoradiography using  $^{14}$ C-iodoantipyrine. The results were summarized as follows:

- 1) There were no significant changes of blood pressure during the infusion of naloxone and there were no significant differences of pH,  $PCO_2$ ,  $PO_2$ , blood glucose and rectal temperature among saline-, low-dose and high-dose naloxone-treated groups.
- 2) High-dose naloxone-treatment reduced significantly the size of infarction.
- 3) The serial 1 mm-band rCBF measurement of

cerebral cortex showed that there was a slight tendency of a marginal rCBF improvement in a small portion of high-dose naloxone-treated group.

4) The areas of  $>50$ ,  $25-50$ , and  $<25$  ml/100 g/min of rCBF values at the coronal sections 4, 6, 8 mm from the frontal pole were measured. The area of  $<25$  ml/100 g/min of rCBF was reduced significantly in the high-dose naloxone-treated group compared to the saline-treated group.

In summary, these results indicate that high-dose naloxone pretreatment reduced the size of infarction and improved the rCBFs in the focal cerebral ischemia of rats.

## 6. Balloon Test Occlusion of the Internal Carotid Artery with $^{99m}Tc$ -HMPAO Brain SPECT

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To period preoperatively the safety of permanent occlusion of an internal carotid artery with  $^{99m}Tc$ -HMPAO brain SPECT from an objective point of view.

Twenty-four patients underwent balloon test occlusion (BTO) of the internal carotid arteries because of neck and skull base tumors. The authors assessed the uptake of both middle cerebral artery territories before and during BTO with  $^{99m}Tc$ -HMPAO brain SPECT, and compared the results with other factors (neurologic examination, arterial stump pressure, and electroencephalogram).

Nineteen patients had not experienced neurologic deterioration or any problem during BTO. Their comparative uptakes of the middle cerebral artery territories were 95%-101% of the pre-BTO state. The remaining five patients showed severe neurologic symptoms such as transient hemiplegia and unconsciousness. Their comparative uptakes of the middle cerebral artery territories were 77%-85% of