

日本語要約

- ◎ ナノサイズの磁性体を腫瘍内に注入し、RF加温を併用した世界で初の臨床例を報告した
- ◎ 温熱療法は43度以上で、極めて強力な腫瘍縮小効果が期待できるが、臨床的に43度以上にできることは難しいことが多い
- ◎ この症例では、磁性体の腫瘍内注入により2度の腫瘍温度上乘せが得られ、これによると思われる著しい抗腫瘍効果で、完全治癒が得られた

A case of submandibular gland carcinoma treated with chemoradiotherapy plus hyperthermia using magnetite nanoparticle-loaded liposome

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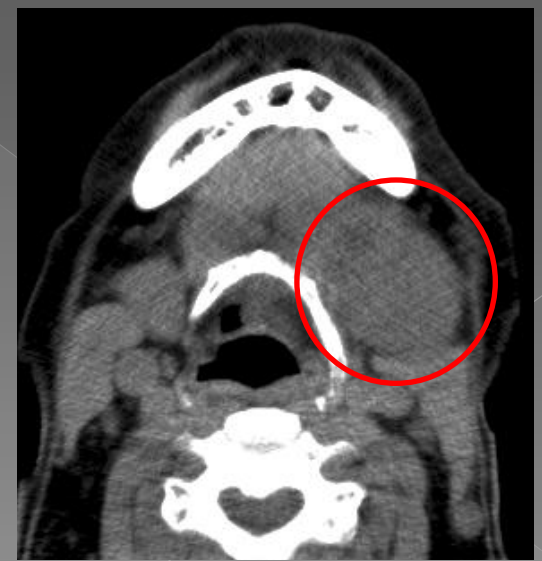
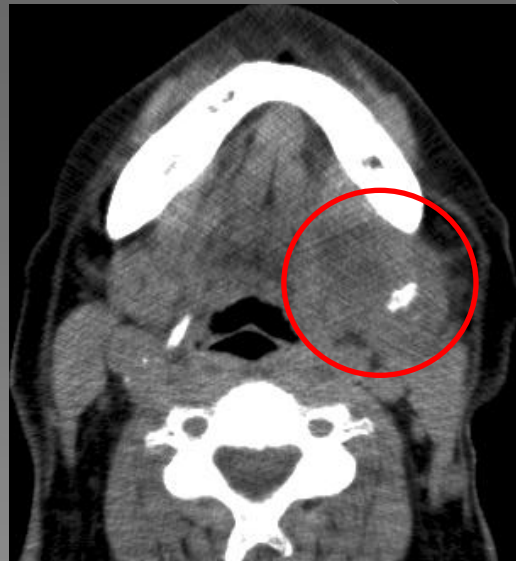
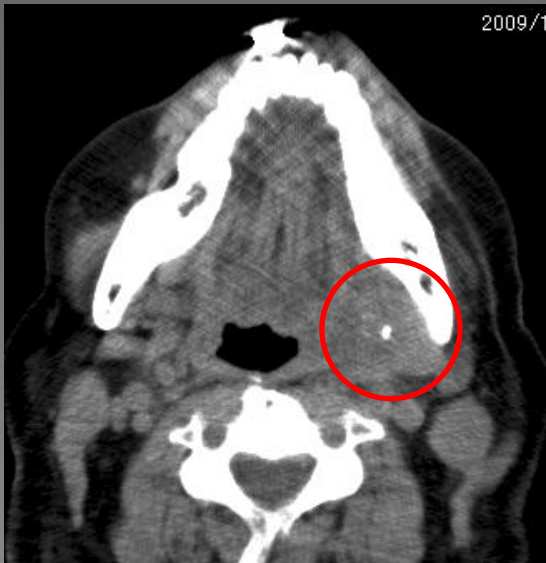
Takayuki Ohguri

Backgrounds

- Tumor temperature was raised by intra-tumor injection of magnetite cationic liposomes (MCLs) with radiofrequency-capacitive (RF) regional hyperthermia (HT) in vivo.
- We experienced the clinical application on a case with inoperative advanced submandibular gland carcinoma.

Case

- A case was a 71-year-old man with left side submandibular gland carcinoma (clinical stage III, T3N1M0 and pathological diagnosis SCC).
- He treated with chemo-radiotherapy with HT and a total dose of 72Gy.
- We combined intra-tumor injection of MCLs HT because of huge and invasive tumor.

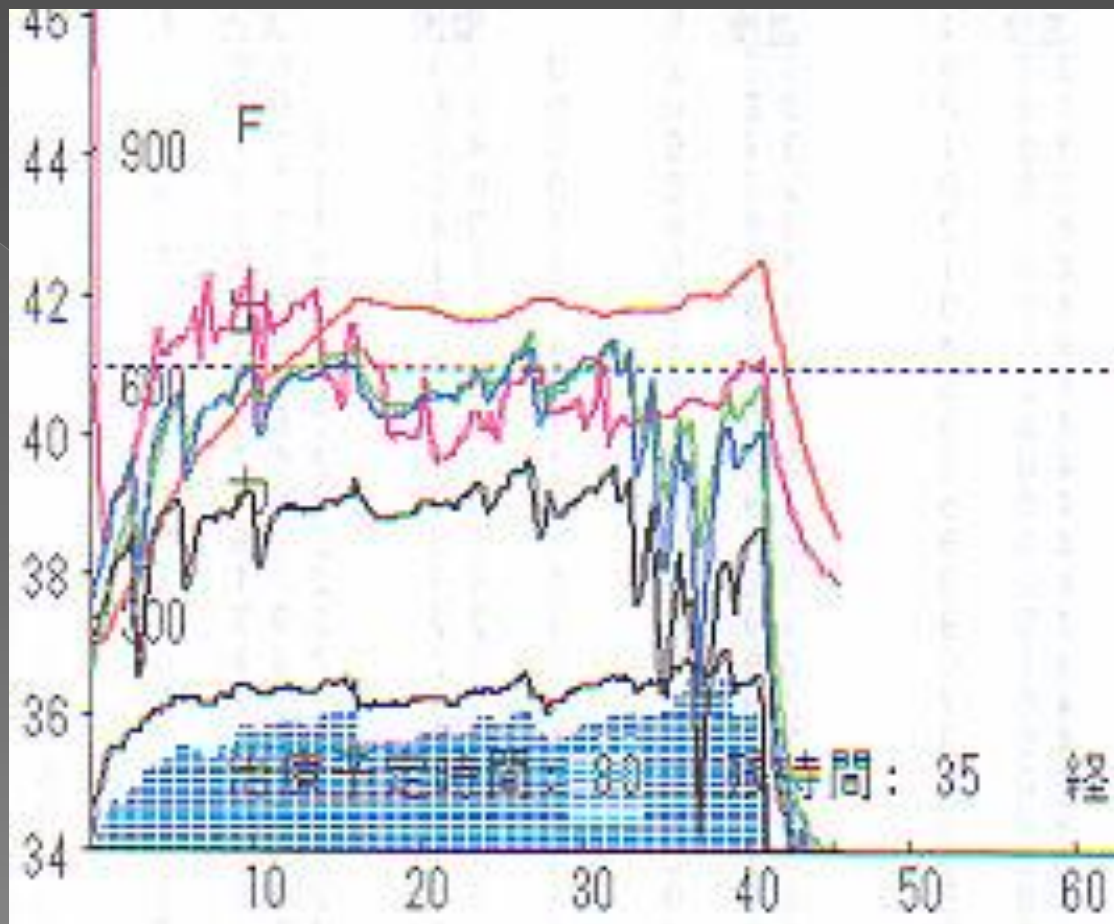


Hyperthermia

- ◉ Period: 2010/2-3, 5 sessions
- ◉ Treatment time: 50min
- ◉ Power average: 200W
- ◉ Electrode size: 7/ 30cm
- ◉ Circulating water: 37°C

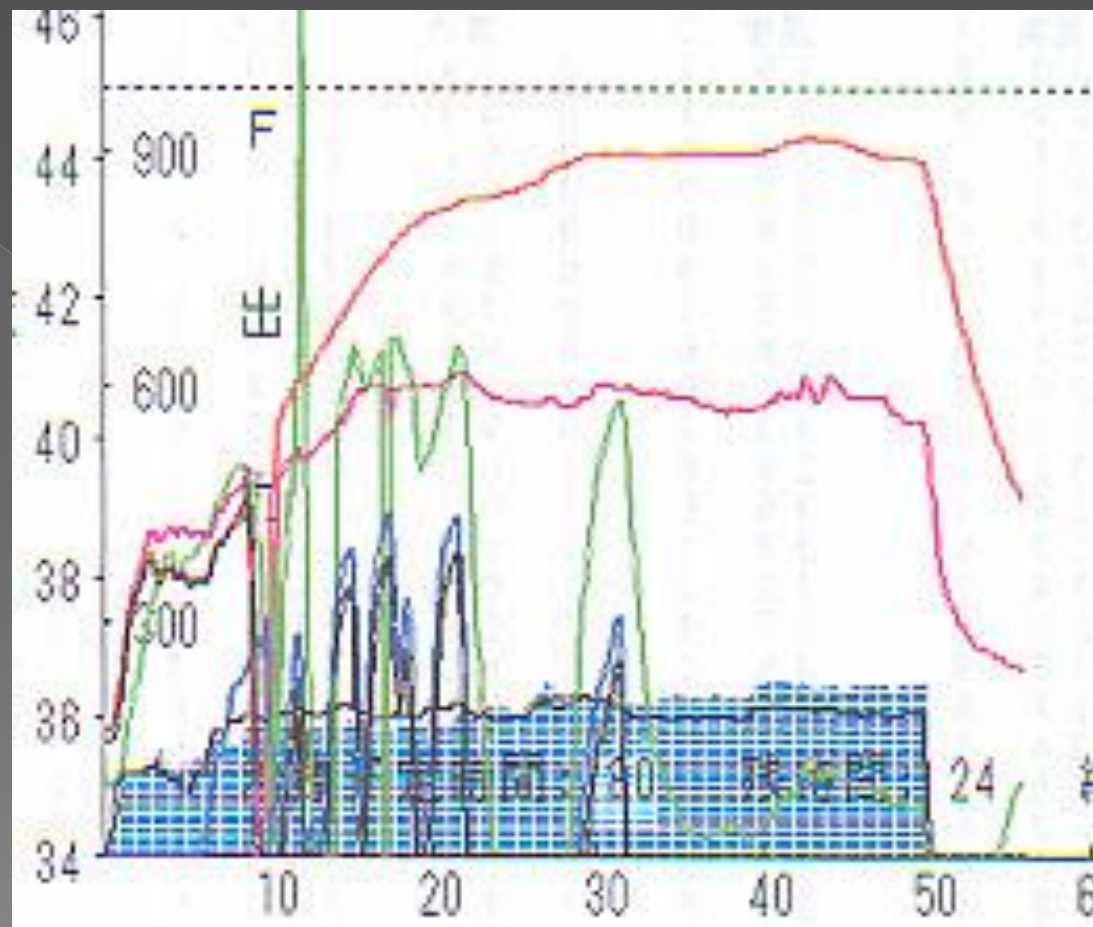
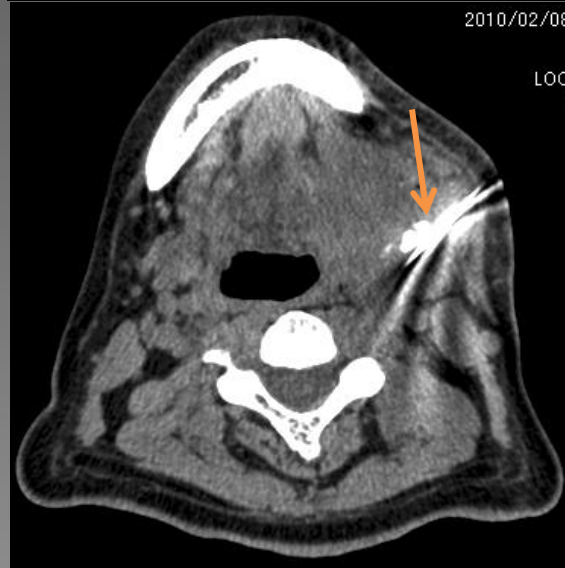


Control HT



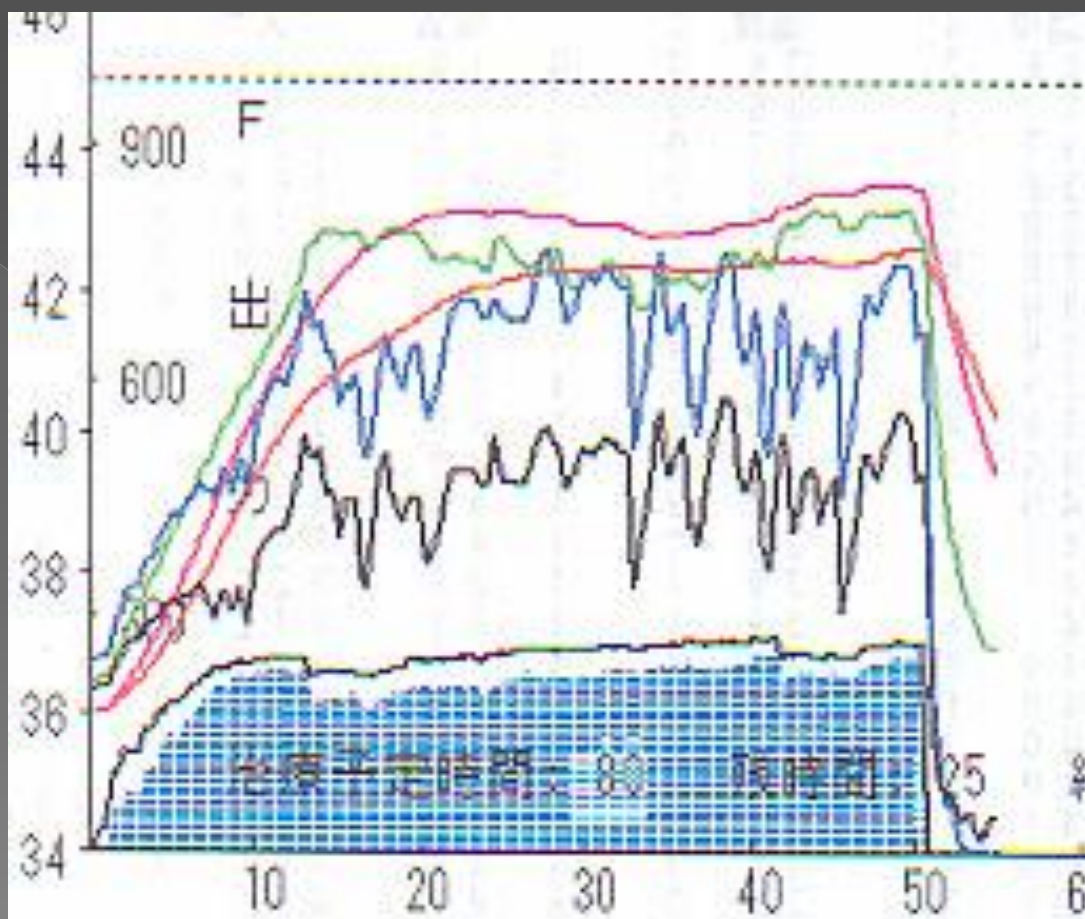
RF output: 200w
Tmax: 42.4 °C

HT just after intra-tumor injection of MCLs



RF output: 200w
Tmax: 44.3 °C

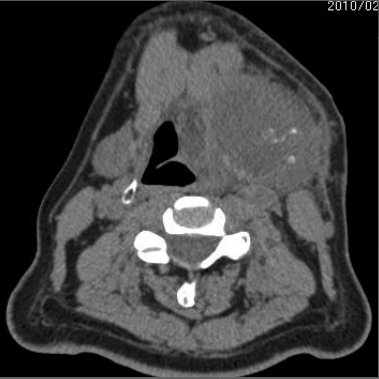
HT a month after intra-tumor injection of MCLs



RF output: 200w
Tmax: 43.5 °C

Progress after treatment

2010/02



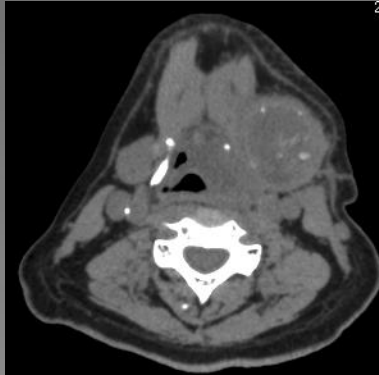
2 days after HT with intra-tumor injection of MCLs

Temporary pharyngeal edema was occurred, but this edema was diminished by using steroid.



12 days after HT with intra-tumor injection of MCLs

MCLs was recognized in the tumor.



2 months after HT with intra-tumor injection of MCLs

Reduction of tumor volume and residual MCLs was recognized.

Progress after treatment



3 months after HT with intra-tumor injection of MCLs

Temporary pharyngeal-tumor fistula was occurred, but this fistula was cured by conservative therapy.



7 months after HT with intra-tumor injection of MCLs

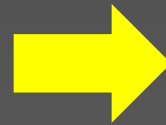
Reduction of tumor volume and no residual MCLs was recognized.



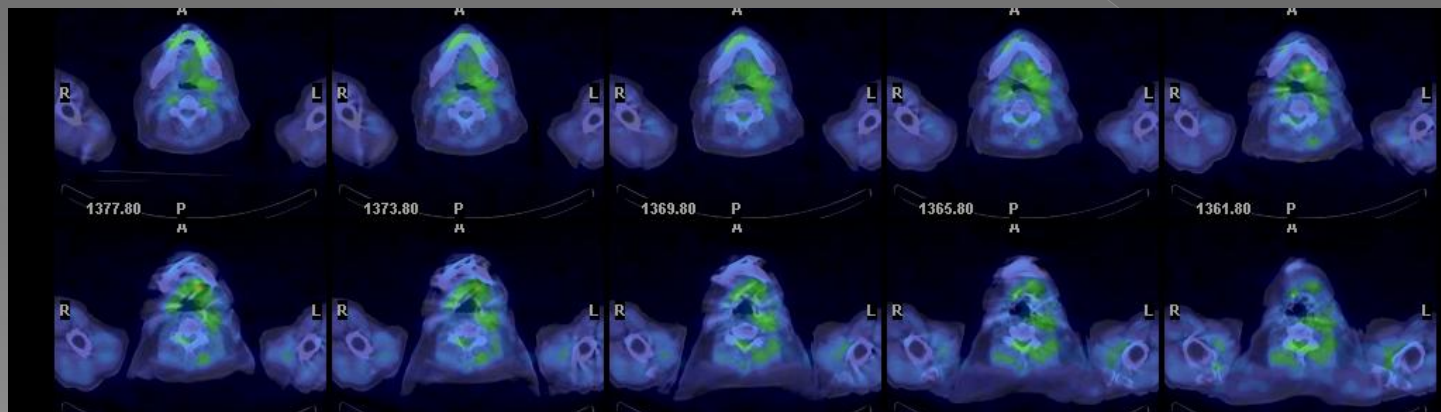
30 months after HT with intra-tumor injection of MCLs

Tumor was completely diminished.

CT and PET



Local response: CR
No FDG uptake in
PET after 7 months



Results

- Intra-tumor temperature was raised about 2 °C just after injection of MCLs and about 1 °C a month after injection of MCLs.
- Intra-tumor MCLs was recognized after 6 months CT. 3 months after injection of MCLs, formation of tumor-pharyngeal fistula was occurred and improved by the conservative treatment.
- A year after treatment, neck tumor was completely diminished and complete response is maintained to date.

Discussion

- Intracellular HT using MCLs by an alternating magnetic field (AMF) for cancer has showed high complete tumor regression rate in vivo, and several clinical trials have way on.
- Weak point of intracellular HT by AMF was shallow heating range.
- Kobayashi et al reported the effectiveness of intracellular HT using MCLs by RF capacitive HT in vivo.
- Benefit of intracellular HT by RF HT was relatively deep heating range.
- The result of this case suggested that intracellular HT using MCLs by RF HT was potentially effective tools for superficial cancer treatment.

Conclusion

- In a clinical case, the efficacy of intra-tumor injection of magnetite nanoparticle-loaded liposome with radiofrequency-capacitive regional HT was shown.
- Further evaluation of safety and injection methods is needed for the practical application.