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Early changes in apparent diffusion coefficient as an indicator of response to sorafenib in hepatocellular carcinoma

Key words: Hepatocellular carcinoma, Sorafenib, Apparent diffusion coefficient, Magnetic resonance imaging(MRI)

Research Summary

- This study was to investigate the ADC changes of advanced HCC under sorafenib treatment.

- Athymic mice with HepG2 xenografts were allocated to two groups: control and sorafenib (40 mg/kg, bid). T2 and diffusion images were acquired at each time point (0, 10, 14, and 18 d post-therapy). Tumor volume and changes in ADC were calculated.

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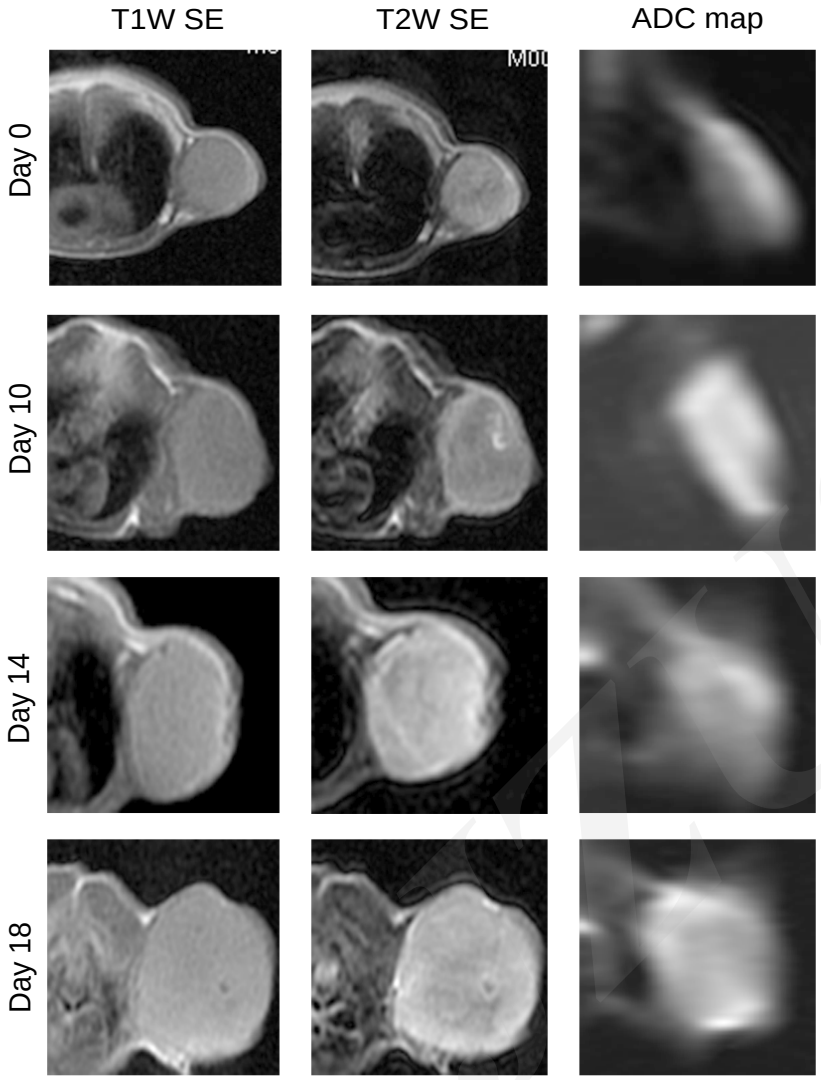


Fig. ADC maps of representative treated groups obtained before therapy and at different time post-therapy

At 10 day after administration of sorafenib, a high-signal intensity was observed in the central part of the tumors on T2-weighted images(T2WI), suggesting necrosis in the central region of tumors (white arrow). At 14 d after administration, a significant increase in T2WI and ulceration of the tumor surface was found (white arrowhead)

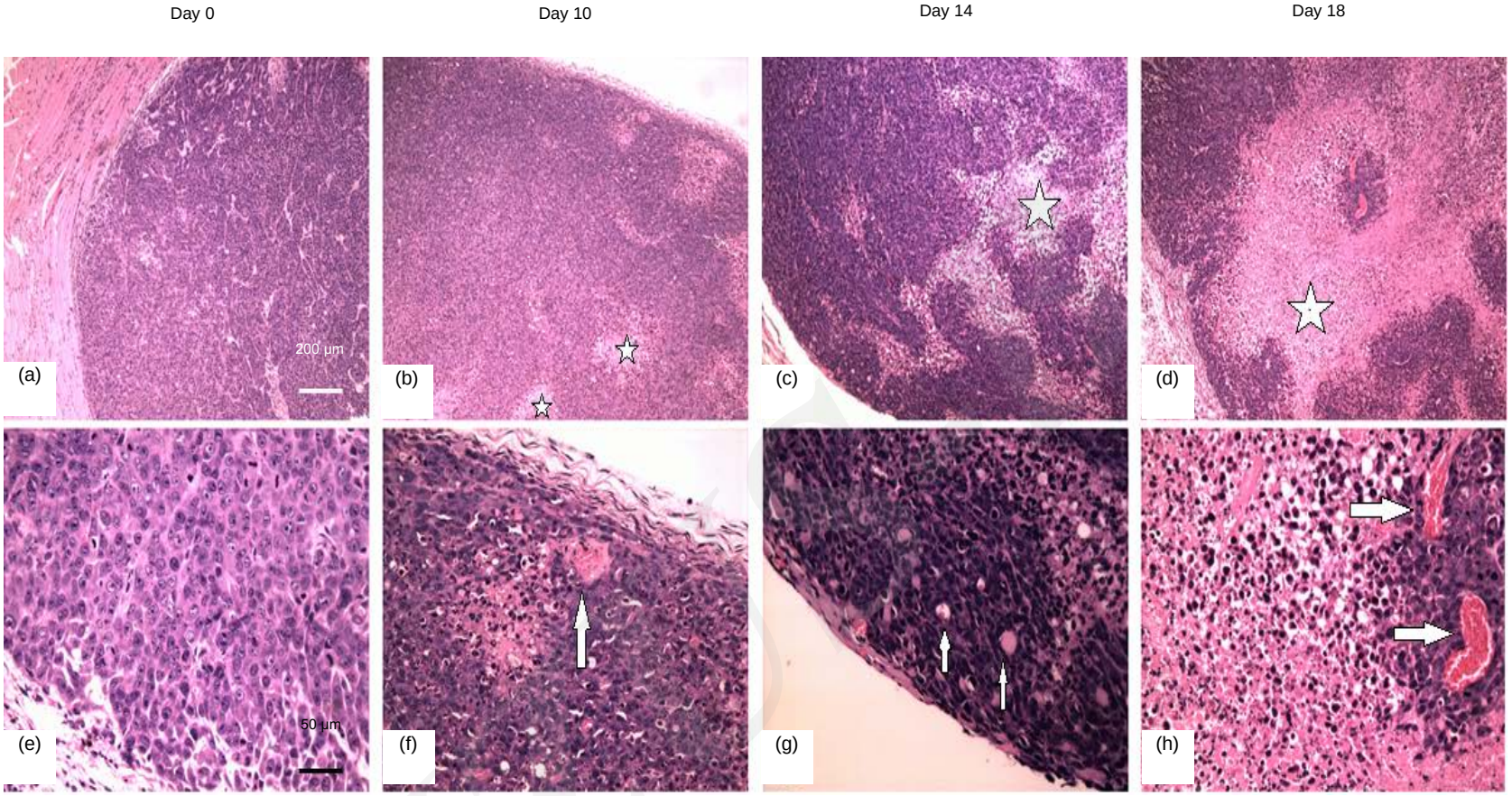


Fig. Hematoxylin and eosin(H&E)-stained histologic sections of representative treated groups obtained before therapy and at different time post-therapy

(a, e) Day 0; (b, f) Day 10;(c, g) Day 14;(d, h)Day 18.((b–d)The necrotic regions have become increasingly clear (asterisks);(e) Histologic images at 0 d. (f)Vascular hyaline degeneration on Day 10 (×400) (white arrow);(g)Vascular dilation and microthrombosis in the peripheralregion on Day 14 (×400) (white arrow);(h)Vascular thrombosis in the central part on Day 18 (×400) (white arrow)

Conclusion

- Sorafenib is effective in treating HCC.
- *In vivo* MRI experiments have shown that early changes in ADC are promising signs for effective sorafenib treatment.
- Indicating that these parameters could yield clinically important information in the prediction of sorafenib response for HCC.

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