

뇌신경재활

게시일시 및 장소 : 10 월 18 일(금) 13:15-18:00 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 15:45-16:30 Room G(3F)

## **P 2-46**

### **The relationship between consciousness and the ARAS in patients with traumatic brain injury**

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#### **Objectives**

We investigated the relationship between consciousness and the ascending reticular activating system (ARAS) by using diffusion tensor tractography (DTT) in patients with traumatic brain injury (TBI).

#### **Methods**

Twenty-six patients with TBI and 13 healthy control subjects were recruited for this study. Glasgow Coma Scale (GCS) scores were used for evaluation of subject consciousness state at the chronic stage of TBI (at DTT scanning). According to the GCS score, the patient group was divided into two subgroups: A (14 patients; impaired consciousness: GCS score <15, and B (12 patients; intact consciousness; GCS score = 15). Fractional anisotropy (FA) and tract volume (TV) values were assessed in the lower dorsal and upper ARAS.

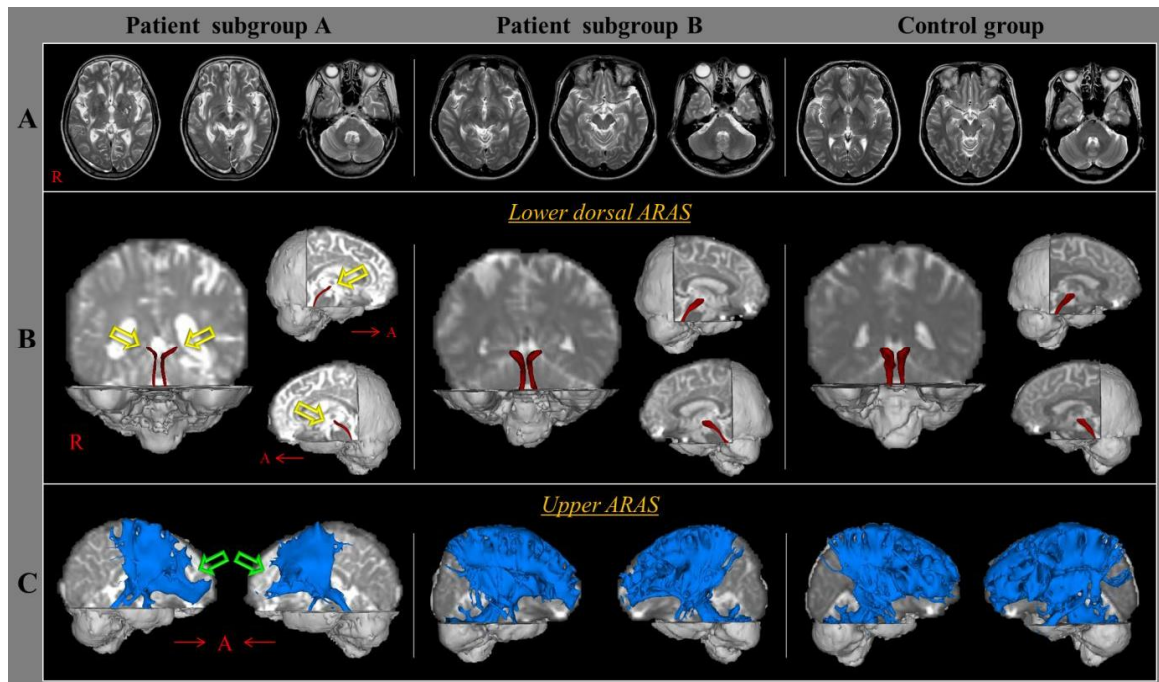
#### **Results**

The FA values of the lower dorsal ARAS and the upper ARAS in patient subgroup A were significantly lower than those in patient subgroup B and the control group ( $p < 0.05$ ). In the patient group, the FA value of the lower dorsal ARAS ( $r = 0.713$ ,  $p < 0.05$ ) and the TV of upper ARAS ( $r = 0.484$ ,  $p < 0.05$ ) had a moderate positive correlation with GCS score. The FA value of upper ARAS had a strong positive correlation with GCS score in the patient group ( $r = 0.780$ ,  $p < 0.05$ ).

#### **Conclusions**

We detected a close relationship between consciousness at the chronic stage of TBI and injuries of the lower dorsal and upper ARAS (especially, the upper ARAS) in patients who showed impaired consciousness at the onset of TBI. We believe that our results can be useful during the development of therapeutic strategies for patients with impaired consciousness following TBI.

Acknowledgment :This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korean Government(MSIP) (No. 2018R1A2B6000996).



Results of diffusion tensor tractography (DTT) for the ascending reticular activating system (ARAS). (A) T2-weighted brain magnetic resonance images at the time of diffusion tensor imaging scanning in representative subjects of patient subgroup A (71-year-old female), patient subgroup B (33-year-old male), and the control group (50-year-old female). (B) Results of DTT for the lower dorsal ARAS. Narrowing (yellow arrows) is observed in both lower dorsal ARAS in patient subgroup A compared to that in patient subgroup B and the control group. (C) Results of DTT for the upper ARAS. A decreased neural tract (green arrows) is observed in both upper ARAS in patient subgroup A compared with that in patient subgroup B and the control group.