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Significant Factors In The Development Of Tight Cast Syndrome After Closed Reduction And Casting Of Paediatric Distal Radius Fractures

Trauma / Paediatric Trauma / Complications

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Background
In daily practice it is common that, pediatric patients with long or short arm casts visit emergency departments with a complaint of swollen fingers and pain which is named as ‘’tight cast syndrome’’ (TCS) by us.
Objectives
There is not any study about the factors which are important for the occurrence of TCS in the literature. Our aim was to evaluate the most important factors which can cause ‘’tight cast syndrome’’ in pediatric patients with distal radius fractures.
Study Design & Methods
Patients, who were at or under 15 years old and treated conservatively with an diagnosis of distal radius fracture between August 2015 and August 2017 were included in to the study. Fifty four patients, who had been found to experience TCS were accepted as group 1 and 62 patients without TCS as group 2. Cast index, pre-/post reduction translation, pre-/post reduction angulation, localization and displacement of the fracture, need for re-manipulation, and presence of associated distal ulna fracture were evaluated for both two groups. Statistical analysis was performed to evaluate cut off value for cast index values for both TCS and loss of reduction and logistic regression analysis of the other possible factors.
Results
Pre-/post-reduction translation (over 50% and 10%, respectively), a cast index value below than 0.775, displaced type fracture, presence of re-manipulation and associated distal ulna fracture were found to be statistically significantly important for the occurrence of TCS. The most important factors were decreased cast index value and presence of initially displaced type fracture. Loss of reduction (LOR) risk was found to be increased in patients with a cast index value of greater than 0.875.
Conclusions
One should be very careful when following a pediatric patient who have a displaced distal radius fracture which has initial/post reduction translation in AP plane, which is associated with distal ulna fracture, which required re-manipulation and most importantly which cast index is under than 0.775 in terms of occurrence of TCS. We recommend obtaining a cast index value between 0.775 and 0.875 to prevent both TCS and LOR. If the fracture seems to be unstable, we recommend applying a splint following percutaneous Kirschner wire fixation of the fracture instead of tightly applied cast to overcome possible complications.