

7.3-year FU confirms safe early conversion to below elbow cast for non reduced diaphyseal forearm fractures of both bones in children

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Objectives

- Secondary analysis after minimal of 5 year FU of patients from the previous RCT for functional outcomes and radiological analyses
- Determine the influence of remaining growth on functional outcome and radiologic malunions?
- Is early conversion to below elbow cast a safe treatment also at long term FU?

Methods

- Study design; long-term follow-up of a previous RCT
- All children that participated in the original RCT were invited for the long-term follow-up measurements
- Primary outcome was limitation of forearm rotation after 7 years compared to 7 months of follow-up
- Secondary outcomes were loss of flexion and extension of the elbow and wrist compared to the contralateral forearm, the ABILHAND-kids questionnaire and the DASH questionnaire, JAMAR grip strength and radiological assessment

Results

The mean length of follow-up was 7.3 (range 6.2-8.4) years

Loss of forearm rotation showed improvement in both groups over time(Table 3).

There was no significant difference between both groups in the final forearm rotation(Table 4).

Secondary outcomes showed no statistically significant differences.

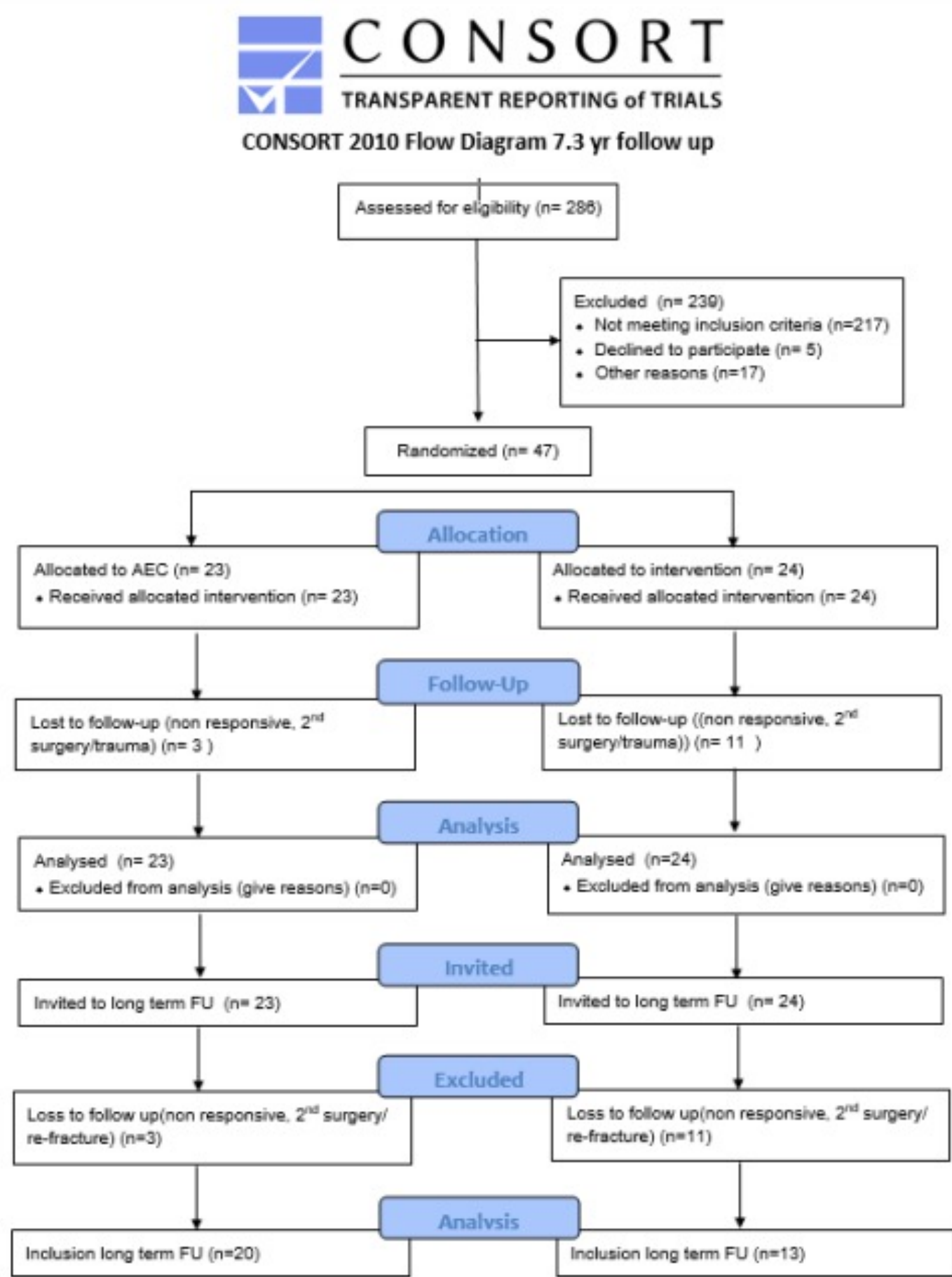
Finally the function of children aged <9 years almost all fully recovered indifferent of their previous treatment, compared to more remaining loss of forearm rotation in children age >9years.

TABLE 3 Loss of forearm rotation of the fractured arm subgroups analysis in percentages		
2 months after trauma	AEC	AEC+BEC
Degrees	n=31, %	n=35, %
None	6.8	13.1
1-10	20.3	31.1
11-20	25.4	19.7
21-30	15.3	8.2
>31	32.2	27.9
Mean limitations (SD) *	27.9 (22.1)	20.8 (17.9)
7.2 months after trauma	n=31, %	n=35, %
None	21.3	32.8
1-10	19.7	28.1
11-20	29.5	21.9
21-30	11.5	10.9
>31	18.0	6.3
Mean limitations (SD)*	17.8 (16.1)	11.3(11.5)
7.3 years after trauma	n=28, %	n=13, %
None	42.1	66.7
1-10	36.8	16.7
11-20	5.3	8.3
21-30	15.8	8.3
>31	0	0
Mean limitations (SD)*	7.7 (13.7)	8.1 (25.1)

AEC= above elbow cast, BEC= below elbow cast, *= degrees, SD= standard deviation

TABLE 4. Data on primary and secondary outcomes at 7.3year follow-up			
	AEC	AEC/BEC	P-value
	(N = 20)	(N = 13)	
Age at follow up, years(range)	13.8 (7.7-22.3)	13.5 (9.0-21.3)	0.7
Follow up length, years(range)	7.1 (4.4-8.8)	7.7 (6.6-9.6)	0.2
Loss of forearm rotation, degrees(SD)	7.7 (13.7)	8.1 (25.1)	1.0
Loss of wrist flexion-extension, degrees(SD)	-0.2 (0.7)	0 (0)	0.4
Loss of elbow flexion-extension, degrees(SD)	0 (0)	0 (0)	0.8
ABILHAND-kids questionnaire*(SD)	39 (7.7)	41 (3.5)	0.6
DASH score **(SD)	8.3(14.8)	8.2 (10.7)	1.0
JAMAR score***(SD)	25 (13)	27 (9)	0.6

AEC= above elbow cast, BEC= below elbow cast, N= number of patients, * ABILHAND-kids questionnaire (0-42)/42 being optimal score, **DASH-score(0-100/100 being worst score), ***JAMAR score(ratio)=grip strength affected wrist/contralateral side, SD= standard deviation



Conclusions

Long term follow-up after an average of 7.3 years showed that loss of forearm rotation improved significantly compared to 7 months, independent of the initial treatment.