



Fig. E-1A
Six-year-old child with rod-and-wire fixation for the treatment of atlanto-occipital dislocation.



Fig. E-1B
At the fourteen-year follow-up evaluation, there was solid fusion and only mildly increased lordosis.

TABLE E-1 Summary of Data on Childhood Survivors of Atlanto-Occipital Dislocation

Case	Year	Age at Accident (yr)	Sex	Duration of Follow-up (mo)	Cause*
1	1991	7	M	132	Struck by automobile
2	1992	3	M	180	Struck by automobile
3	1993	9	F	108	ATV with clothesline
4	1996	6	F	144	Automobile acc. (restrained passenger)
5	1998	4	M	156	Automobile acc. (restrained passenger)
6	2000	6	F	97	Automobile acc. (restrained passenger)
7	2003	7	M	104	Automobile acc. (restrained passenger)
8	2007	5	F	18	Automobile acc. (restrained passenger)
9	2008	4	M	48	Automobile acc. (unrestrained passenger)
10	2009	3	F	33	Automobile acc. (unrestrained passenger)
11	2010	1	F	15	Automobile acc. (unrestrained passenger)
12	2011	3	M	6	Automobile acc. (restrained passenger)
13	2011	10	M	8	Automobile acc. (unrestrained passenger)
14	2011	5	F	7	Automobile acc. (unrestrained passenger)

*ATV = all-terrain vehicle accident. †ISCI = incomplete spinal cord injury, CSCI = complete spinal cord injury, and TBI = traumatic brain injury.
 ‡T = thoracic injury, Ab = abdominal injury, Sk = skeletal fracture, and Sp = spine fracture at a different level. §W = wires, CR = contoured rod, and occ = occiput.

TABLE E-1 (continued)

Admission Neurological Status†	Associated Injuries‡	Fusion Technique and Levels§	Neurological Outcome
ISCI/TBI	Ab/Sk	Wires: occ-C1	Hyperreflexia
CSCI/TBI	T/Ab/Sk	Wires: occ-C1	Left hemiparesis
6th nerve palsy	—	Wires: occ-C1	Normal
ISCI/TBI/3rd and 7th nerve palsy	—	CR + W: occ-C2	Right hemiplegia + mild ataxia
TBI	—	CR + W: occ-C2	Normal
ISCI/TBI/6th nerve palsy	T	CR + W: occ-C4	Left hemiplegia
CSCI/TBI/6th nerve palsy	Sp	CR + W: occ-C3	Quadriplegia
Normal	Ab/Sp	CR + W: occ-C4	Normal
ISCI/TBI	T/Sk/Sp	CR + W: occ-C4	Right hemiplegia
TBI	T/Sp	CR + W: occ-C2	Normal
TBI/6th nerve palsy	Sp	CR + W: occ-C3	6th nerve palsy
6th nerve palsy	—	CR+W: occ-C3	6th nerve palsy
TBI	T/Ab	CR + W: occ-C2	Normal
Brown-Séquard/TBI	T/Ab/Sk	CR + W: occ-C2	Normal