

TABLE E-1 Summary of Coventry³ and Achterman and Kalamchi¹ Classification Systems and Treatment Recommendations

Classification	Definition	Recommended Treatment
Coventry ³		
Type I	Hypoplastic fibula	Foot preservation
Type II	Rudimentary/absent	Foot ablation
Type III	Bilateral or other anomalies	Probable foot preservation
Achterman and Kalamchi ¹		
Type I	Fibula present	
A	Fibula supports ankle joint, <30% shortening	Epiphysiodesis
B	Fibula does not support ankle joint, 30% to 50% shortening	Epiphysiodesis and additional surgery
Type II	Fibula vestigial/absent	Foot amputation

TABLE E-2 Demographic Features and Management of 104 Patients with 126 Affected Extremities Treated at Texas Scottish Rite Hospital for Children between 1971 and 2005*

Case	Clinical Deformity Classification	Achterman-Kalamchik ¹	Coventry ³	Side Affected	No. of Surgical Procedures	Definitive Surgical Procedure	Additional Surgical Procedures	No. of Foot Rays	Ankle Deformity	Fibular Deformity	Fibular Size (% of tibia)
1	2A	II	II	L	2	Syme	Revision with osteotomy	3	Planar	Vestigial	0
2											
	1A	IA	III	R	1	EPD	None	4	Ball-and-socket	>50%	95
	1C	IA	III	L	2	EPD	Tibial osteotomy	4	Ball-and-socket	>50%	82
3	1C	IB	I	L	5	Lengthening	EPD, TAL	5	Ball-and-socket	>50%	67
4	1C	II	II	L	2	Syme	Foot centralization	5	Planar	Vestigial	0
5	2A	II	II	R	1	Syme	None	3	Planar	Vestigial	0
6	1B	IB	II	L		None		5	Planar	10% to 50%	40
7	1B	IB	I	R	2	Lengthening	EPD	5	Ball-and-socket	>50%	80
8	1A	IA	I	R	1	EPD	None	4	Ball-and-socket	>50%	95
9	1A	IA	I	L	1	EPD	None	5	Normal	>50%	95
10											
	1A	II	III	R	1	None	Osteotomy	2	Planar	Vestigial	0
	2B	II	III	L		None	None	4	Planar	Vestigial	0
11											
	1A	IA	III	R	1	None	Osteotomy, foot centralization	3	Ball-and-socket	>50%	95
	1C	II	III	L	1	Syme	None	3	Planar	Vestigial	0
12	2A	II	II	R	5	Syme	Knee release,	2	Planar	Vestigial	0

							osteotomy				
13											
	1A	IA	III	L	2	EPD	Osteotomy	5	Ball-and-socket	>50%	95
	1B	II	III	R	1	None	Osteotomy	3	Planar	Vestigial	0
14	1C	IA	I	L	2	Lengthening	PMR, TAL	5	Ball-and-socket	>50%	0
15											
	1A	IA	III	L	1	None	Osteotomy, PMR, TAL	5	Ball-and-socket	>50%	90
	1B	II	III	R	3	Lengthening	Osteotomy, PMR, TAL	5	Planar	Vestigial	10
16	1A	IA	I	R	3	EPD	Foot centralization	5	Normal	>50%	95
17	1B	IA	I	R	1	EPD	None	3	Ball-and-socket	>50%	95
18	1A	IA	I	L	2	EPD	Revision EPD	4	Ball-and-socket	>50%	95
19	1B	IA	I	R	1	EPD	None	4	Ball-and-socket	>50%	95
20	1A	IA	I	R		None		3	Normal	>50%	95
21	1B	IA	I	R	1	EPD	None	3	Ball-and-socket	>50%	95
22											
	1A	IA	III	R	3	Syme	EPD	4	Planar	10-50%	40
	2A	II	III	L	3	Syme	Revision	4	Planar	Vestigial	0
23	1C	II	II	R	1	Syme	None	4	Indeterminate	Vestigial	0
24	1A	IA	I	R	2	EPD	None	3	Ball-and-socket	>50%	95
25	1C	II	II	L	2	Syme	PMR	3	Planar	Vestigial	0
26	1A	IA	I	L	4	EPD	Tibialis anterior transfer, femoral shortening	3	Ball-and-socket	>50%	95

27	1A	IA	I	L	1	EPD	None	5	Normal	>50%	80
28	1C	II	II	R	1	Syme	None	4	Indeterminate	Vestigial	0
29	1A	IA	I	R	2	Lengthening	Tibial and femoral	4	Normal	>50%	95
30	2A	II	II	R	2	Syme	Hemi-EPD	3	Indeterminate	Vestigial	0
31											
	1A	II	III	L	1	None	Foot centralization	4	Planar	Vestigial	0
	1A	II	III	R	1	None	Foot centralization	4	Planar	Vestigial	0
32	1B	IA	I	L	1	EPD	None	5	Ball-and-socket	>50%	70
33	1A	IA	I	R	1	EPD	None	5	Ball-and-socket	>50%	86
34	1C	II	II	R	2	EPD	Revision EPD	5	Ball-and-socket	Vestigial	0
35	1A	IA	I	L		None		5	Normal	>50%	95
36	1A	IA	I	R	1	EPD	None	4	Ball-and-socket	>50%	95
37	1A	IA	I	L	2	EPD	Ray resection	6	Ball-and-socket	>50%	70
38	1D	II	II	R	1	Syme	None	3	Planar	Vestigial	0
39	1B	IA	I	L	4	Lengthening	EPD, knee arthroscopy	4	Ball-and-socket	Vestigial	0
40											
	1A	II	III	L	1	Syme	None	3	Planar	Vestigial	0
	1C	IA	III	R	2	None	PMR	3	Planar	>50%	95
41	2A	II	III	R	5	Syme	PMR, Dwyer, triple arthrodesis	3	Planar	Vestigial	0
42	1C	IB	I	L	2	Lengthening	Hemi-EPD	5	Planar	10-50%	35
43	1A	IA	I	R	1	None	Ray resection	4	Ball-and-	>50%	95

									socket		
44	1C	IA	I	R	3	Lengthen ing	Osteotomy, EPD	4	Ball-and- socket	>50%	90
45	1C	II	II	R	1	Syme	None	4	Ball-and- socket	Vestigial	0
46	1C	II	II	R	4	Lengthen ing	Osteotomy, knee release	5	Planar	Vestigial	0
47	1A	IA	I	R	1	EPD	None	4	Ball-and- socket	>50%	95
48	2A	II	II	L	2	Syme	EPD	3	Planar	Vestigial	0
49	1A	IA	I	L	1	EPD	None	5	Normal	>50%	90
50	1A	IA	I	R	1	EPD	None	3	Ball-and- socket	Indetermin ate	0
51											
	1A	II	III	L		None		5	Planar	Vestigial	0
	1B	II	III	R		None		5	Planar	Vestigial	0
52	2A	II	II	R	2	Syme	Revision and osteotomy	3	Normal	10% to 50%	15
53	1B	IB	II	R		None		5	Ball-and- socket	Indetermin ate	0
54	1C	II	II	R	1	EPD	None	3	Planar	Vestigial	0
55	1A	IA	I	L	1	EPD	None	3	Normal	>50%	95
56											
	2A	II	III	L	1	Syme	None	2	Planar	Vestigial	0
	2A	II	III	R	1	Syme	None	1	Planar	Vestigial	0
57	1B	IA	I	L	2	EPD	Osteotomy	4	Normal	>50%	90
58											
	1A	IA	III	R	3	Lengthen ing	PMR, osteotomy	3	Planar	>50%	90
	1A	IA	III	L		None		4	Ball-and- socket	>50%	95
59											
	1A	II	III	R	1	None	Osteotomy	3	Planar	Vestigial	0
	2A	II	III	L		None		0	None	Vestigial	0
60	1A	IA	I	L	1	EPD	None	5	Ball-and-	>50%	95

									socket		
61	2A	II	II	L	1	Lengthen ing	None	3	Planar	Vestigial	0
62	1B	II	II	L	2	EPD	Osteotomy	5	Planar	Vestigial	0
63	1B	IA	I	L	1	EPD	None	4	Planar	>50%	95
64											
	1A	IA	III	L	1	None	Osteotomy	4	Ball-and- socket	>50%	0
	1A	IA	III	R	1	None	Osteotomy	4	Ball-and- socket	>50%	90
65											
	1A	IA	III	L		None		4	Ball-and- socket	>50%	85
	1B	IA	III	R		None		4	Ball-and- socket	>50%	90
66	1C	II	II	L	5	Lengthen ing	TAL	5	Planar	Vestigial	0
67	1A	IA	I	R	2	Lengthen ing	EPD	5	Normal	>50%	90
68	1B	IA	I	R	1	Lengthen ing	None	5	Normal	>50%	95
69	1B	IA	I	L	1	EPD	None	5	Normal	>50%	95
70	1C	II	II	R	4	Lengthen ing	EPD, revision EPD	5	Planar	Vestigial	0
71	1A	IB	I	L		None		5	Ball-and- socket	10% to 50%	50
72	1A	IA	I	R	2	EPD	Osteotomy	4	Ball-and- socket	>50%	85
73	2A	IA	I	R	3	Syme	Revision with osteotomy	3	Normal	>50%	95
74											
	1A	IA	III	L		None		4	Normal	>50%	95
	1A	IA	III	R		None		4	Normal	>50%	95
75											
	2A	II	III	R	1	Syme	None	3	Planar	Vestigial	0

	2A	II	III	L	1	Syme	None	3	Planar	Vestigial	0
76	1C	IA	I	R	2	Lengthen ing	EPD	3	Ball-and- socket	>50%	71
77											
	2A	II	III	L	2	Syme	Osteotomy	2	Indetermin ate	Vestigial	0
	2A	II	III	R	2	Syme	Osteotomy	2	Indetermin ate	Vestigial	0
78	1A	IA	I	R		None		5	Normal	>50%	95
79											
	2A	II	III	L	1	Syme	None	3	Planar	Vestigial	0
	2A	II	III	R	2	Syme	None	3	Planar	Vestigial	0
80	1B	IA	I	L	2	Lengthen ing	Osteotomy	3	Ball-and- socket	>50%	90
81	1C	IA	I	L		None		4	Ball-and- socket	>50%	85
82	1A	IA	I	L	1	EPD	None	5	Normal	>50%	90
83	1D	II	II	R	2	Lengthen ing	EPD, osteotomy	5	Normal	Vestigial	10
84	1C	II	II	R	1	Syme	None	3	Indetermin ate	Vestigial	0
85	1C	II	II	L	1	Syme	None	4	Indetermin ate	Vestigial	0
86											
	1A	IA	III	R	1	None	PMR	5	Ball-and- socket	>50%	95
	1B	II	III	L	2	Lengthen ing	Osteotomy	4	Planar	Vestigial	0
87	1A	IA	I	R	1	Lengthen ing	None	4	Ball-and- socket	>50%	95
88	1B	IA	I	R	2	Lengthen ing	EPD	5	Ball-and- socket	>50%	90
89	1A	IA	I	R		None		5	Normal	>50%	95
90	1B	IA	I	R		None		3	Planar	>50%	95
91	1B	IA	I	R		None		3	Ball-and-	>50%	90

									socket		
92	1B	II	II	L	1	Lengthen ing	None	5	Planar	Vestigial	0
93											
	1A	IA	III	R		None		3	Normal	>50%	95
	1C	II	III	L	1	Syme	None	3	Indetermin ate	Vestigial	95
94											
	2A	II	III	R	1	Syme	None	2	Indetermin ate	Vestigial	0
	2A	II	III	L	1	Syme	None	1	Indetermin ate	Vestigial	0
95	2A	II	II	R	1	Syme	None	3	Planar	Vestigial	0
96	1A	IA	I	L		None		4	Ball-and- socket	>50%	95
97	1C	IB	II	L		None		5	Planar	Vestigial	0
98	1C	IB	I	L	1	Syme	None	3	Indetermin ate	10% to 50%	38
99	1A	IA	I	R		None		4	Ball-and- socket	>50%	95
100											
	1A	II	III	L	2	Syme	Osteotomy	3	Planar	Vestigial	0
	2A	II	III	R	1	Syme	None	4	Indetermin ate	Vestigial	0
101	1A	IA	I	R		None		4	Ball-and- socket	>50%	95
102	1B	IA	I	R		None		3	Ball-and- socket	>50%	95
103	2A	IA	I	R	1	Syme	None	3	Indetermin ate	>50%	95
104	1A	IA	I	L	1	None	Knee release	5	Normal	>50%	90

*EPD = epiphysiodesis, TAL = tendo Achilles lengthening, PMR = posteromedial release.

TABLE E-3 Treatment of Foot Based on Number of Rays Present

Number of Rays (No. of Feet)	Primary Treatment Modality Performed (<i>no. of feet</i>)			
	None	Epiphysiodesis	Lengthening	Amputation
6 (1)	0	1	0	0
5 (38)	12	13	12	1
4 (37)	15	10	5	7
3 (41)	9	7	4	21
2 (6)	1	0	0	5
1 (2)	0	0	0	2
0 (1)	1	0	0	0

TABLE E-4 Total Number of Limbs with Absent or Vestigial Fibula According to Clinical Deformity Classification

Clinical Classification	Total No. of Affected Limbs	No. of Limbs with Absent/Vestigial Fibula	Percentage of Limbs with Absent/Vestigial Fibula
1A	51	7	13.7%
1B	24	7	29.2%
1C	24	15	62.5%
1D	2	2	100.0%
2A	24	21	87.5%
2B	1	1	100.0%