

## Supplementary

**Table S1** A full summary of all fetal diagnoses, imaging findings on US and MRI and postnatal diagnosis

Case number	Age (years)	Gestational age (weeks + days)	US diagnosis before referral for MRI	MRI diagnosis	Outcomes /follow-up
1	24y	25w	the lumbosacral part slightly curved; hemivertebrae?	(-)	(-)
2	29y	26w	T1, T3 vertebra morphological irregularity	(-)	(-)
3	29y	21w	MRI examination recommended to exclude thoracic abnormalities	(-)	(-)
4	29y	24w	the thoracic vertebra small in size	(-)	(-)
5	30y	25w	MRI examination recommended to exclude middle and lower thoracic abnormalities	(-)	(-)
6	34y	25w+3d	T11, T12 and L1 vertebral bodies slightly smaller	(-)	(-)
7	39y	26w	MRI examination recommended to exclude thoracic abnormalities	(-)	(-)
8	26y	26w+1d	T1, T2 vertebrae arranged irregularly	(-)	(-)
9	34y	26w+3d	T2, T3 vertebrae slightly out of order	(-)	(-)
10	32y	27w	normal, MRI examination recommended	(-)	(-)
11	29y	29w	T2 slightly larger in size	(-)	(-)
12	26y	30w	normal, MRI examination recommended	(-)	(-)
13	27y	30w+5d	the upper thoracic vertebrae arranged irregularly	(-)	(-)
14	33y	36w	normal, MRI examination recommended	(-)	(-)
15	24y	38w	the thoracic block vertebrae	(-)	(-)
16	21y	38w+3d	the sacrococcygeal abnormalities	(-)	(-)
17	31y	28w+1d	the thoracic vertebrae arranged irregularly	(-)	(-)
18	35y	26w	T2, T3 vertebrae body small in size	(-)	(-)
19	32y	28w	T8, T10 irregularity in morphology	(-)	(-)
20	29y	22w+5d	normal, MRI examination recommended	(-)	(-)
21	28y	29w	T12 arranged irregularly	(-)	(-)
22	30y	24w+5d	T8, T9, T10, L3, L4, L5 displayed unsatisfactory	(-)	(-)
23	27y	35w	T8, T9 slightly smaller	(-)	(-)
24	30y	24w	echo of the L1/2 vertebral arch enhanced	(-)	(-)
25	29y	26w+6d	normal, MRI examination recommended	(-)	(-)
26	31y	29w+5d	L2, L3, L4 irregularity in morphology	(-)	(-)
27	27y	36w	normal, MRI examination recommended	(-)	(-)
28	31y	27w+5d	C7 transverse process too long	(-)	(-)
29	27y	31w	normal; MRI examination recommended	(-)	(-)
30	38y	35w	the sacrococcygeal abnormalities	(-)	(-)
31	26y	25w	T5, T8 vertebrae body small in size	(-)	(-)

**Table S1** (continued)

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Case number	Age (years)	Gestational age (weeks + days)	US diagnosis before referral for MRI	MRI diagnosis	Outcomes /follow-up
32	34y	26w	parts of vertebrae arranged irregularly	(-)	(-)
33	31y	34w	T4 irregularity in morphology	(-)	(-)
34	32y	28w+2d	C7, T3, T4 coronal clefts vertebrae?	(-)	(-)
35	26y	24w	L5 coronal cleft vertebra	(-)	(-)
36	26y	24w	normal, MRI examination recommended	(-)	(-)
37	33y	29w+6d	L2 irregularity in morphology	(-)	(-)
38	32y	28w	T4, T5 arranged irregularly	(-)	(-)
39	28y	31w	T10 vertebrae body small in size	(-)	(-)
40	31y	30w	the sacrococcygeal vertebrae arranged irregularly	(-)	(-)
41	33y	27w+1d	the sacrococcygeal vertebrae arranged irregularly	(-)	(-)
42	25y	32w+2d	the lumbosacral vertebrae arranged irregularly	(-)	(-)
43	37y	34w+6d	the upper thoracic vertebrae irregularity in morphology	(-)	(-)
44	32y	27w	thoracic hemivertebra?	(-)	(-)
45	23y	34w	the sacrococcygeal vertebrae poorly showed	(-)	(-)
46	37y	25w	T11 hemivertebra?	T11 hemivertebra?	(-)
47	39y	27w	T12 butterfly vertebra	T12 hemivertebra?	T11 butterfly vertebra
48	22y	24w	T11 butterfly vertebra	T11 butterfly vertebra	T11 butterfly vertebra
49	26y	24w	T11 butterfly vertebra	T11 butterfly vertebra	T11 butterfly vertebra
50	30y	25w	L5 butterfly vertebra?	L5 butterfly vertebra	L5 butterfly vertebra
51	23y	27w	T10 hemivertebra	T10 hemivertebra	T10 butterfly vertebra
52	31y	27w	T8 butterfly vertebra	T8 butterfly vertebra	T8 butterfly vertebra
53	32y	23w	L4 butterfly vertebra	L4 butterfly vertebra	L4 butterfly vertebra
54	38y	29w	T5 hemivertebra	T5 hemivertebra	T5 butterfly vertebra
55	37y	25w+5d	T10 butterfly vertebra?	T10 butterfly vertebra	T10 butterfly vertebra
56	25y	31w	T11 hemivertebra	T11 hemivertebra	T11 butterfly vertebra
57	34y	29w+4d	C5/6, C6/7 intervertebral space narrowing	T4 butterfly vertebra	T4 butterfly vertebra
58	22y	35w+2d	sacrococcygeal vertebra arranged irregularly	T3 butterfly vertebra	T3 butterfly vertebra
59	37y	26w	T10 butterfly vertebra	T10 butterfly vertebra	T10 butterfly vertebra
60	25y	28w	T11 hemivertebra?	T11 butterfly vertebra	T11 butterfly vertebra
61	34y	33w	T10 butterfly vertebra?	T10 butterfly vertebra	T10 butterfly vertebra
62	33y	26w	T9 butterfly vertebra	T9 butterfly vertebra	T9 butterfly vertebra
63	33y	24w	L3 butterfly vertebra?	L3 butterfly vertebra	L3 butterfly vertebra
64	33y	36w+3d	T11 butterfly vertebra	T11 butterfly vertebra	T11 butterfly vertebra

**Table S1** (continued)

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Case number	Age (years)	Gestational age (weeks + days)	US diagnosis before referral for MRI	MRI diagnosis	Outcomes /follow-up
65	29y	27w	T8 hemivertebra	T8 butterfly vertebra	T8 butterfly vertebra
66	23y	32w	T1 irregularity in morphology	T1 hemivertebra	T1 hemivertebra; T3 butterfly vertebra
67	31y	27w	T3, T5, T7, T10 arranged irregularly	T7 butterfly vertebra; T10 hemivertebra	T2, T3, T5, T6, T7, T10 butterfly vertebra
68	34y	25w	L4 butterfly vertebra?	L4 coronal vertebral cleft	disappear
69	30y	29w+4d	L3, L5 coronal vertebral clefts	L3, L5 coronal vertebral clefts	disappear, L2 level fatty filum terminale
70	30y	30w	L2, L3 coronal vertebral clefts	L2, L3 coronal vertebral clefts	disappear; T9-13 vertebral level syringomyelia
71	32y	33w	L2-L5 coronal vertebral clefts	L2-L5 coronal vertebral clefts	disappear
72	32y	25w+6d	L2 butterfly vertebra?	L2 coronal vertebral cleft	disappear
73	22y	26w	L3 butterfly vertebra?	L3 coronal vertebral cleft	disappear
74	32y	34w	L3 coronal vertebral cleft	L3 coronal vertebral cleft	disappear
75	34y	29w	T3-T6, L1-L3 irregularity in morphology	T4-6, L1-3 coronal vertebral clefts	disappear
76	35y	28w+4d	T12-L4 irregularity in morphology	T12-L1, L3-L5 coronal vertebral clefts	disappear
77	26y	28w	L2, L4 arranged irregularly	L2, L4, L5 coronal vertebral clefts	disappear
78	32y	28w	T4, T8, L1 coronal vertebral clefts	T4, T8, L1 coronal vertebral clefts	disappear
79	31y	27w+4d	L3 coronal vertebral cleft	L3 coronal vertebral cleft	disappear
80	30y	30w+2d	normal, MRI examination recommended	L3 coronal vertebral cleft	disappear
81	26y	28w	T10 irregularity in morphology	T10 coronal vertebral cleft	disappear
82	29y	26w	T1-T5, L2-L4 irregularity in morphology	L2 coronal vertebral cleft	disappear
83	29y	34w	T8 coronal vertebral cleft	T8 coronal vertebral cleft	disappear
84	24y	29w	T5-T7, L1-L5 irregularity in morphology	L2, L4 coronal vertebral clefts	disappear
85	37y	30w	L2-L5 irregularity in morphology	L2-5 coronal vertebral clefts	disappear
86	36y	26w	L3 irregularity in morphology	L3 coronal vertebral cleft	disappear
87	22y	27w+ 2d	L1 butterfly vertebra	L1, L3-5 coronal vertebral clefts	disappear
88	30y	34w	T8 vertebra small in size	T8 coronal vertebral cleft	disappear
89	29y	25w	T7, L2, L4 ossification center abnormal	L2, L3, L5 coronal vertebral cleft	disappear

**Table S1** (continued)

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Case number	Age (years)	Gestational age (weeks + days)	US diagnosis before referral for MRI	MRI diagnosis	Outcomes /follow-up
90	28y	25w+3d	lumbar hemivertebra	L3/4 intervertebral space narrowing	L3-4 block vertebra
91	44y	24w	L4 irregularity in morphology	L4 hemivertebra with fusing to one side of L3	L4 hemivertebra with fusing to one side of L3
92	34y	27w	T12 irregularity in morphology	T10 hemivertebra with fusing to one side of T9	T10 hemivertebra with fusing to one side of T9
93	30y	24w	L2 hemivertebra?	L2 hemivertebra with fusing to one side of L3	L2 hemivertebra with fusing to one side of L3
94	26y	24w	L3 vertebra small in size	L2 hemivertebra with fusing to one side of L3	L2 hemivertebra with fusing to one side of L3
95	27y	26w	cervical vertebra hemivertebra	cervical hemivertebra	cervical hemivertebra
96	34y	39w	caudal vertebra irregularity in morphology	L2 hemivertebra	L2 hemivertebra
97	27y	31w+1d	thoracic block vertebra	T7 hemivertebra	T7 hemivertebra
98	32y	28w	scoliosis	T11 hemivertebra	T10 hemivertebra
99	29y	30w+3d	S1 hemivertebra?	S1 hemivertebra	S1 hemivertebra, imperforate anus
100	29y	27w	L1 hemivertebra	L1 hemivertebra	L1 hemivertebra
101	31y	33w	sacrococcygeal vertebra not seen	L5 hemivertebra	L5 hemivertebra
102	35y	34w	T12 hemivertebra	T12 hemivertebra	T12 hemivertebra
103	30y	26w	L2 hemivertebra	L2 hemivertebra	L2 hemivertebra
104	31y	27w	L3 hemivertebra	L3 hemivertebra	L3 hemivertebra
105	26y	26w	L4 hemivertebra	L4 hemivertebra	L4 hemivertebra
106	20y	27w	vertebra irregularity in morphology	T11, L5 hemivertebra	T11, L5 hemivertebra
107	31y	26w	L2 hemivertebra	T7, L2 hemivertebra	T7, L2 hemivertebra
108	29y	21w+6d	thoracic hemivertebra	multiple hemivertebra in thoracolumbar vertebra	T3, T5, T7, T11 hemivertebrae; T8 hemivertebra with fusing to one side of T9; L2, L3 large in size
109	29y	34w	T5 hemivertebra	T5 butterfly vertebra T9 hemivertebra	T5 butterfly vertebra T9 hemivertebrae
110	36y	24w	T4, T9 hemivertebra T8 butterfly vertebra L1-2 block vertebrae	T9 butterfly vertebra; T4 hemivertebra; L1-2 block vertebrae	T8, T9 butterfly vertebrae T4 hemivertebra L2-3 block vertebrae
111	28y	28w+5d	T12-L1 block vertebrae T9 butterfly vertebra	T12-L1 block vertebrae T9 butterfly vertebra	L1-L2 block vertebrae; T10 butterfly vertebra; imperforate anus

**Table S1** (continued)

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Case number	Age (years)	Gestational age (weeks + days)	US diagnosis before referral for MRI	MRI diagnosis	Outcomes /follow-up
112	31y	24w	spina bifida with meningocele; multiple vertebral deformities	spina bifida with meningocele; tethered cord; multiple hemivertebra, butterfly vertebra in thoracolumbar vertebra; multiple intercostal space narrowing on one side	bifida with meningocele; T4 butterfly vertebra; T5-6, T11-12 block vertebra; T7-9, L3-5 hemivertebra; T7-8 rib fused
113	29y	21w+6d	multiple vertebral deformities; hemivertebra?	T5, T11 hemivertebra T10 butterfly vertebra T8-9, L3-4 block vertebra	T3, T5, T7, T11 hemivertebrae; T10 butterfly vertebra; T8-9, L3-4 block vertebrae;
114	26y	29w	T6, T7 hemivertebrae?	T6, T7, T9 hemivertebrae and/or butterfly vertebra	T5, T7, T8 butterfly vertebrae; T6 hemivertebra
115	30y	24w	T11, T12 arranged irregularly	T11-12 block vertebra	T3 hemivertebra; T4, T8, T9 butterfly vertebrae; T11-12 block vertebra
116	26y	31w	cervical vertebral arranged irregularly	cervical vertebral body and appendix arranged irregularly	the congenital undescended scapula syndrome (sprengel deformity); cervical closed spina bifida
117	28y	23w+2d	multiple vertebral deformities with scoliosis	T6, T9 butterfly vertebra; T8 hemivertebra	T6, T9 butterfly vertebra; T8 hemivertebra
118	28y	25w	multiple vertebral deformities with scoliosis in upper thoracic	C6, T1 hemivertebra	C6, T1 hemivertebra; T2 butterfly vertebra
119	29y	22w	multiple vertebral deformities with scoliosis	multiple vertebral deformities	C6, C7, T3, T4 hemivertebra T1-2 block vertebra; T5 butterfly vertebra
120	23y	29w	vertebrae arranged irregularly in lower cervical and upper thoracic	T6-8 block vertebrae and/or hemivertebrae	T3 butterfly vertebra; T5-6, T11-12, L4-5 block vertebrae
121	27y	31w	the sacrococcygeal vertebrae poorly showed	anterior sacral meningocele (ASM); sacrococcygeal vertebra dysplasia;	anterior sacral meningocele (ASM): sacrococcygeal vertebra dysplasia; Caudal degeneration syndrome
122	32y	29w	low position of the conus medullaris	sacral vertebra dysplasia tethered cord meningocele	sacral agenesis tethered cord meningocele; Caudal degeneration syndrome
123	34y	25w+6d	the sacrococcygeal vertebra poorly showed; anus imperforate	sacral vertebra below S2 not visible	sacral agenesis: sacral vertebra below S2 not visible; anus imperforate; Caudal degeneration syndrome

**Table S1** (continued)

**Table S1** (*continued*)

Case number	Age (years)	Gestational age (weeks + days)	US diagnosis before referral for MRI	MRI diagnosis	Outcomes /follow-up
124	31y	26w	the sacrococcygeal vertebrae showed poorly with thoracic hemivertebra	T9 hemivertebra sacral vertebrae below S1 not visible	T9 hemivertebra sacral vertebrae below S1 not visible; Caudal degeneration syndrome
125	26y	27w	the sacrococcygeal vertebra poorly showed	sacral vertebral below S1 not visible	sacral agenesis: sacral vertebrae below S1 not visible; Caudal degeneration syndrome
126	21y	30w	cervicothoracic vertebrae arranged irregularly	cervicothoracic vertebrae segmental spinal dysgenesis	cervicothoracic vertebrae segmental spinal dysgenesis
127	27y		scoliosis	scoliosis	scoliosis

US, ultrasound; MRI, magnetic resonance imaging.