

Ultra-Low-Dose Fetal CT for the Prenatal Diagnosis of Skeletal Dysplasia: Clinical Impact in a Five-Case Series

Nozomi Mise, Ayako Inatomi, Daisuke Katsura, Shinsuke Tokoro, Shunichiro Tsuji
Department of Obstetrics and Gynecology, Shiga University of Medical Science



INTRODUCTION

Ultrasound alone may be insufficient for classification of skeletal dysplasia and assessment of lethality. Fetal CT provides detailed skeletal evaluation but raises concerns regarding radiation exposure.

OBJECTIVE

To evaluate the diagnostic value and clinical impact of ultra-low-dose fetal CT in suspected skeletal dysplasia.

METHODS

Study Design

Retrospective case series (2022-2025)

Inclusion Criteria

- Suspected skeletal dysplasia on ultrasound
- No major associated anomalies

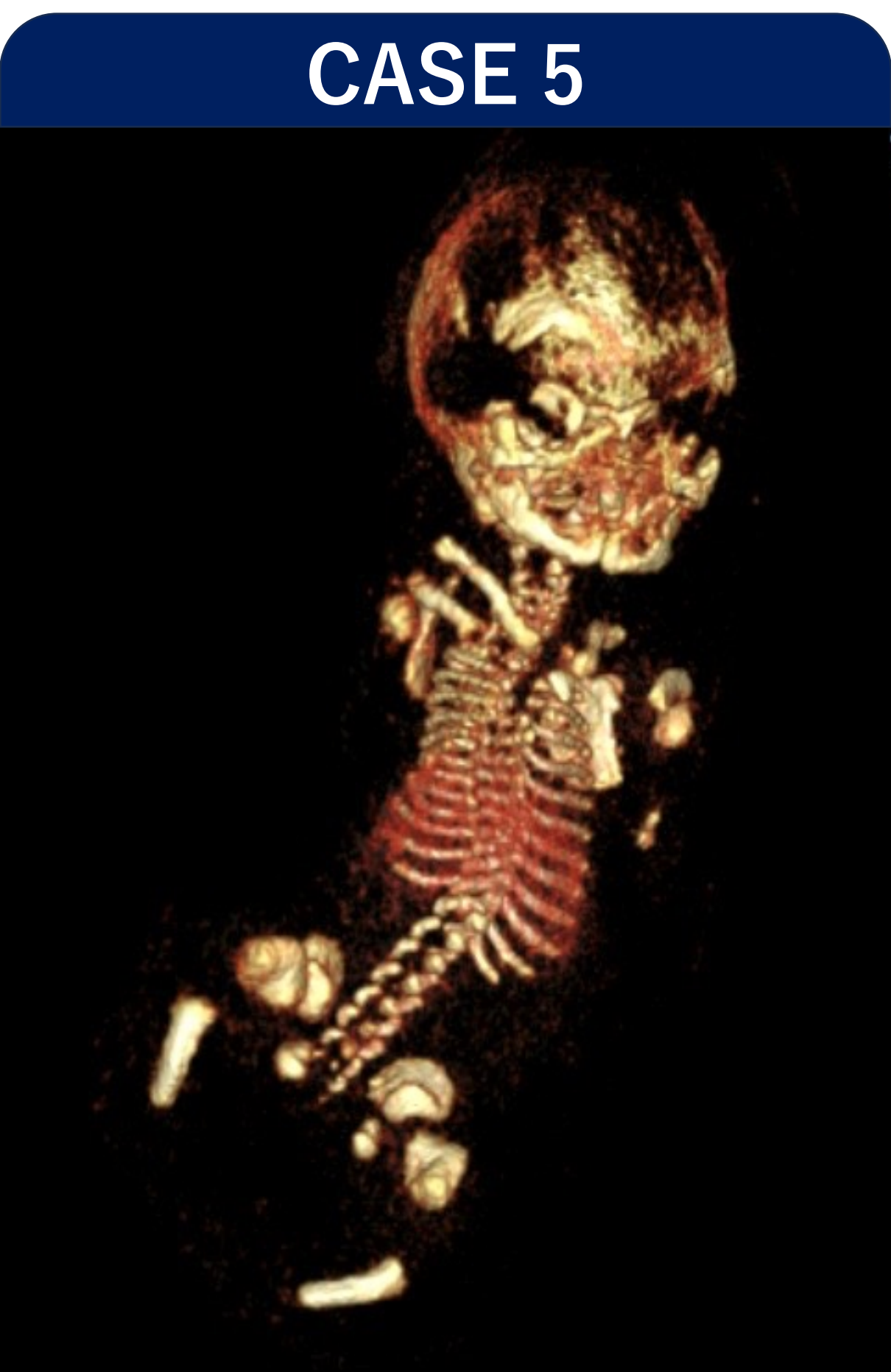
CT Protocol

Ultra-low-dose fetal CT
(SSDE <6 mGy, 3D reconstruction)

Outcomes

- Diagnostic classification
- Assessment of lethality
- Impact on clinical management
- Concordance with postnatal diagnosis

Figure 1. Three-dimensional fetal CT images from five cases.



Ultra-low-dose fetal CT enabled detailed visualization of skeletal abnormalities and facilitated prenatal classification.

RESULTS

Patient Characteristics

N=5

Median GA at CT (wk)	27.5 (19-33)
Median CTDIvol (mGy)	2.8 (2.5-4.1)
Median SSDE (mGy)	3.9 (3.1-5.6)

Main Findings

- Ultrasound alone did not allow definitive classification.
- Fetal CT enabled classification in all cases.
- Lethality assessment became possible after CT.
- Pregnancy termination was selected in one case.
- Delivery planning and genetic counseling were provided in four cases.
- Prenatal and postnatal diagnoses were concordant in 4/5 cases.

CONCLUSIONS

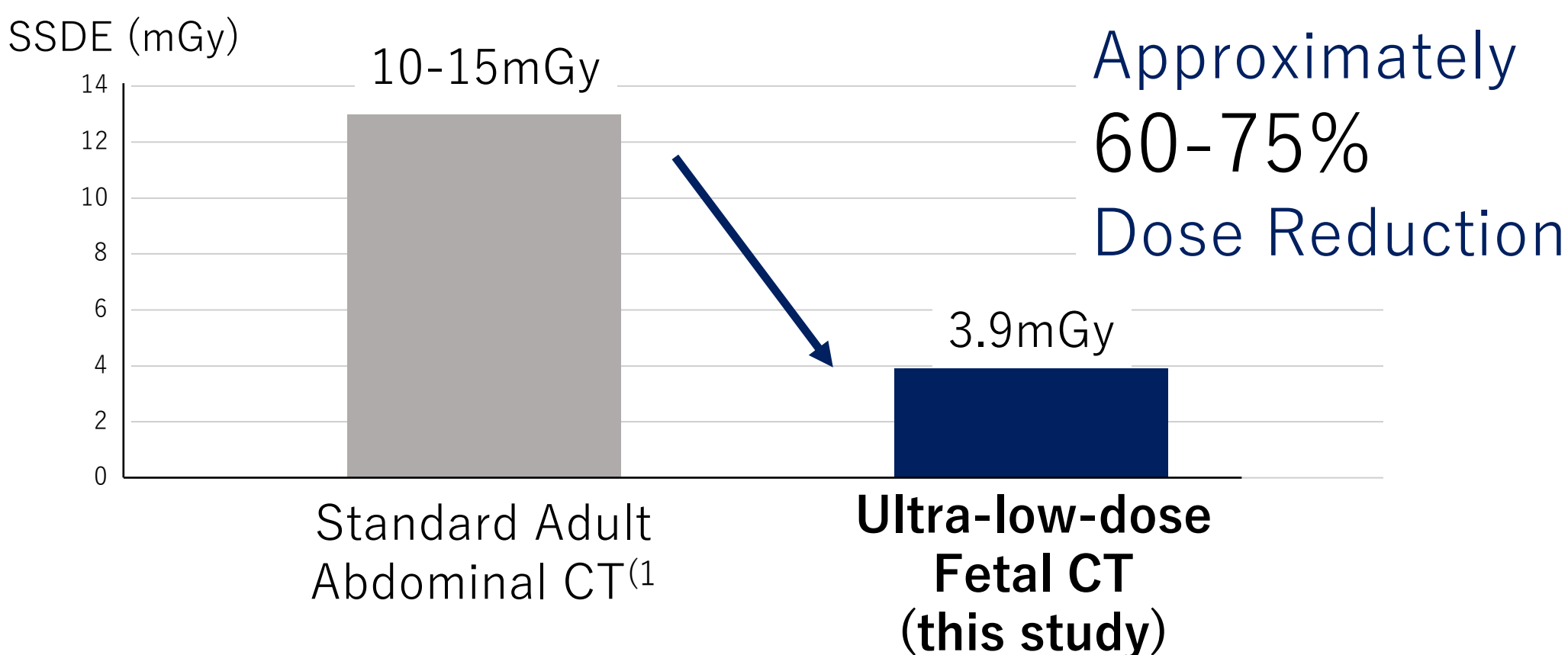
Ultra-low-dose fetal CT enabled classification of skeletal dysplasia and assessment of lethality when ultrasound findings were inconclusive.

- ✓ Enabled diagnosis in all cases.
- ✓ Informed counseling and perinatal management.
- ✓ Maintained diagnostic performance despite very low radiation dose.

DISCLOSURES

Conflict of Interest
The authors declare no conflicts of interest.

RADIATION DOSE COMPARISON



CLINICAL IMPACT

Case	GA at CT	Key US findings	CT diagnosis	CTDIvol (mGy)	SSDE (mGy)	Outcome
1	19	Limb shortening	Thanatophoric dysplasia	2.8	3.9	Termination at 19 weeks, Thanatophoric dysplasia
2	32	Limb shortening	Achondroplasia	3.6	4.6	Vaginal delivery at 38 weeks, Achondroplasia (genetically confirmed)
3	33	Spinal anomaly	Congenital kyphosis	4.1	5.6	Vaginal delivery at 40 weeks, Segmental spinal dysgenesis
4	31	Limb shortening	Spondyloepiphyseal dysplasia congenita (SEDC)	2.5	3.1	Vaginal delivery at 39 weeks, SEDC
5	24	Limb shortening	Boomerang dysplasia	2.7	3.4	Elective cesarean section at 33 weeks, Boomerang dysplasia (genetically confirmed)

References:
1. J-RIME. Japan DRLs 2025.
2. Miyazaki O, et al. Ultrasound Obstet Gynecol. 2016.
3. Salomon LJ, et al. Ultrasound Obstet Gynecol. 2022.