Intra-uterine fetal demise, stillbirth and pregnancy termination are dramatic situations. In order to provide the most precise diagnosis to support a prognosis for future pregnancies, the family is asked to consent to a fetal examination consisting in chromosomal and molecular genetic tests, macro and micropathologic studies as well as autopsy. Imaging of the fetus is part of the fetal autopsy process. We have recently added 3DCT to our fetal autopsy imaging protocol in order to assess skeletal anomalies as the spontaneous CT contrast of soft tissue is not sufficient.

Material and Methods

After internal review board approval, from September 2006 to September 2010, 300 consecutively deceased fetuses, either after intra-uterine fetal demise (IUFD) or medical pregnancy termination or stillborn infants were studied with conventional X-rays and whole body CT fetograms as part of the fetal autopsy process.

Conventional Xray fetograms (CFX) consisted in frontal and lateral views of the whole fetus above 20-week gestational age (GA) with additional frontal views of the limbs under 20-week GA. Whole body fetal CT allowed 3D reconstructions of the fetus (3DCTF) in Volume Rendering (VR) and Maximum Intensity Projection (MIP) with VR of the fetal trunk as well as of the fetal head before and after electronic removal of the posterior aspect of the calvaria (fig. 1). The review of these 3D images was done using still images as well as video clip that are not possible to show here.

Skeletal dysplasias

- There were 89/300 pts with skeletal anomalies.
- Skeletal dysplasias were depicted in 15 pts
  - Osteogenesis imperfecta (fig. 2) 4
  - Chondrodysplasia punctata (fig. 3) 3
  - Thanatophoric dyspl (fig. 4) 3
  - Spondylocostal dyspl (fig. 5) 2
  - Hypophosphatasia 1
  - Ellis van Creveld 1
  - Campomelic dyspl 1

- There were 89/300 pts with skeletal anomalies.
- Skeletal dysplasias were depicted in 34 pts
  - Limb body wall complex (fig. 9) 3
  - 11 or 13 pairs of ribs 7
  - Vertebral anomalies 4
  - Polydactyly (1 Smith Lemli Opitz, 2 Meckel Gruber, 2 isolated)
  - Limb anomalies 10
    - (3 PFFD (fig. 10), 2 radial aplasia (fig. 11), 1 phocomelia, 4 other)
  - Conjoint twins (fig. 12) 2
  - Cranio facial dysostosis 3
    - (2 cleft palate, 1 mandible hypoplasia)

- There were 89/300 pts with skeletal anomalies.
- Skeletal deformities related to an underlying disorder were detected in 40 pts
  - Anencephaly 9
  - Macrocephaly 2
  - Microcephaly 2
  - Hypotelorism 1
  - Nasal encephalocele 1
  - Cystic hygroma 6
  - Abdominal distension 10
  - Club feet 4
  - Sacro-coccygeal teratoma 1
  - Fetal maceration 4

Skeletal dysostosis

- There were 89/300 pts with skeletal anomalies.
- Skeletal dysostosis were depicted in 34 pts
  - Osteogenesis imperfecta (fig. 2) 4
  - Polydactyly (1 Smith Lemli Opitz, 2 Meckel Gruber, 2 isolated)
  - Chondrodysplasia punctata, no evidence of punctate calcifications on conventional or 3DCT VR or MIP fetograms. Short humeri.
  - Thanatophoric dysplasia (fig. 4) 3
  - Spondylocostal dyspl (fig. 5) 2
  - Hypophosphatasia 1
  - Ellis van Creveld 1
  - Campomelic dyspl 1

Skeletal deformities

- There were 89/300 pts with skeletal anomalies.
- Skeletal deformities due to chronic abdominal distension in a 22-week GA fetus