2p duplication syndrome presenting with multiple anomalies
Trakya University, Department of Perinatology, Genetics, Edirne, Turkey

Objective
2p Duplication Syndrome is a rare genetic disorder that originates from the short arm of the second chromosome and causes a range of symptoms and changes depending on the size of the copied material. We present a case with 2p duplication with multiple anomalies.

Methods
A 23-year-old patient with gravida 1 was referred at the 13th weeks due to nuchal translucency (NT) thickness. Ultrasound evaluation revealed an NT measurement of 6 mm, a single great vessel (truncus arteriosus) and ventricular septal defect (Figure 1). Chorionic villus sampling (CVS) was recommended, but the patient decline the procedure. However, the patient applied again for amniocentesis (AS) at the 17th weeks, diaphragmatic hernia, hypertelorism, wide forehead, small and pointed chin, downward and large ears were observed (Figure 2). AS was performed and termination option was offered to the family, but the family refused. Fluorescence in situ hybridization (FISH) result was reported as normal, but karyotype culture result showed 46, XY, der(3)add(3)(q29). Also, array comparative genome hybridization (array CGH) revealed a 54 mb size duplication in 2p25.3-16.2 (Figure 3). Afterwards, genetic analysis was performed to the mother and father. The mother’s result was normal, but the father had a translocation of 46, XY, t(2;3)(p25;p15). Termination option was re-offered to the family, but the family refused it again. After that, the family applied for termination when the fetus was 23 weeks. Vaginal misoprostol was administered and abortion occurred. The post-abortion images are shown below (Figure 4).

Results
Mostly 2p duplication syndrome occurs as a result of de novo mutations and no defined risk factor in most of the cases was defined. The fetus is affected in cases where the mother and father are carriers of the translocation. Major disorders are observed in this syndrome such as wide and large forehead, hypertelorism, large and low-set ears, small and triangular chin, cleft palate, abnormal hands and feet, neurodevelopmental delay, behavioral disorders, mental retardation, minor genital anomalies, lung problems, diaphragmatic defect, cardiac anomalies, and some specific dental problems, most of mentioned disorders which were present in our case. In our case, the duplication region affected was large. There are many genes defined in this region. It has been stated that genes in the 2p24 region are also required for neural tube development. Gdf7 (growth differentiation factor 7) is a gene located in the 2p24.1 region. MYCN oncogene is located at the 2p24.3 region, that may be involved in the development of cancer affecting immature nerve cells (neuroblastoma). Also, genes as SOX11 at 2p25.2 and MYT1L (myelin transcription factor 1) at 2p25.3 regions are thought to play an important role in the developing central nervous system and that may play a role in the developmental delay and learning difficulties associated with a 2p duplication. In general, in karyotype analysis when a duplication or a deletion is detected in the fetus, genetic analysis from maternal and paternal blood samples is required. In the family analysis of our case, 46, XY, t(2;3)(p25;p15) was detected in the father, which might be an important genetic information for the family’s future pregnancy planning. Then, the family was given genetic counseling about assisted reproductive techniques (ART) and preimplantation genetic diagnosis (PGD), but in cases which pregnancy occurred naturally, genetic counseling should be about CVS/AS options.

Conclusion
When multiple structural anomalies were observed in the fetus, advanced methods such as array-CGH and parental examination in addition to classical karyotyping seems mandatory. This may enlighten some familial genetic anomalies which would be important in terms of future pregnancy planning of the family. Figure 1: 13th gestational weeks; ventricular septal defect Figure 2: 13th gestational weeks Truncus arteriosus Figure 3: Array-CGH; region 2p25.3-16.2 in 54 mb size duplication Figure 4: Post abortion images.