Psychological education is the main advantage of ultrasound techniques as it helps in preparing the parents psychologically for what to expect.

There's a new prototype for neonatal surgery that can detected any syndrome before birth. There are promising results obtained for this prototype in animal studies to repair the defects before birth, and hopefully in the future this can be applied to humans. The main advantage of this treatment modality is the absence of scar tissue formation.

Cleft lip and palate cases should be managed by a trained craniofacial team. This team should be trained in treating these cases. Not any surgeon or orthodontist or social worker or nurse is qualified to treat cases of cleft lip and palate. Ideally, a surgeon or orthodontist should be trained specifically for management of these cases.

Management of these cases is a continuous procedure that starts at birth and discontinued when the patient is 18 years old.

**A brief history:**

In the early 19th century, cleft lip and palate cases were managed by constructing dentures with obturators for the patients.

In the 1960s and 1970s, surgical corrective procedures started being used to correct clefts and other craniofacial anomalies.

Nowadays, there are many fine-tuned surgical procedures.

In the 50's and 60's, orthodontics started having a role in treating cleft lip and palate cases by what is called pre-surgical orthodontics.

Primary bone grafts were developed in the 80's.

Distraction osteogenesis is a promising procedure which first started being carried out in the 90's.

A recent concept is the use of undifferentiated stem cells along with bone morphogenic proteins (BMPs) to repair craniofacial defects and promote development of bone. This modality may be used clinically in the very near future. These stem cells have the potential to differentiate into bone, soft tissues, and muscles; so an advantage of this method is that surgical complications are avoided and proper tissues are obtained.

In the 90's, a lot of emphasis was placed on the outcome of treatment of cleft lip and palate cases. They established 6 centers across Europe for treatment of cleft lip and palate. It was found that the best treatment outcome was achieved by the Norwegian protocol. The other centers were compared to the Norwegian center regarding soft tissues, occlusion, dental arch relationships, appearance, and symmetry.

As mentioned previously, there should be a specialized team to treat these cases, and this team should follow a clear protocol.

Centralization is an important concept which means that each area should have a specialized center for clefts. For example, Jordan can be mainly divided into the southern region, northern region, and the central region. Each region would have a center or "hub" where all cases of cleft lip and palate in that region would be referred to.

The specialized team should consist of one surgeon and one orthodontist along with specialized nurses and social workers.

For a surgeon to be considered as specialized in cleft lip and palate management, the surgeon should treat at least thirty cases of cleft lip and palate a year.

It is important to have good outcome measures and to take standardized records to monitor treatment outcomes. It is the orthodontist's job to take and keep these records. The orthodontist is also the one who keeps everything together in the team, sort of like a team leader.

**Norwegian protocol for cleft lip and palate treatment:**

* No pre-surgical orthopedics.
* Closure of cleft lip at 3 months.
* Closure of remaining posterior palate (primary repair) at 18 months. This is delayed as much as possible.
* Secondary operation when needed, which is an alveolar bone graft at age 8 to 9 years.
* If the patient needs orthognathic surgery, this is carried out at the proper time which is when the patient is 18 years old.
* Comprehensive orthodontic treatment might be needed and it is postponed to when the patient reaches early adulthood.

The most important members of the team to treat these cases are the surgeon, the orthodontist, and the speech therapist. If there are any hearing problems the patient is referred to the ENT specialist. The paediatric dentist is also commonly involved. An ophthalmologist is rarely needed. A psychologist may also be a member of the team who works closely with the speech therapist.

The surgeon could be either a plastic surgeon or an oral and maxillofacial surgeon, and it is very important that this surgeon is trained in cleft lip and palate cases.

It is important to focus on the patient's problems such as speech disturbances and growth disturbances.

The orthodontist is involved in taking records at birth.

Paediatric patients who undergo a lot of surgeries are usually spoiled by their parents and are given a lot of sweets, which leads to poor oral hygiene and caries. The paediatric dentist's role in these cases is to treat the caries, apply preventive measures, and to enforce good oral hygiene.

Lip repair is ideally carried out before 3 months. In the Jordan University Hospital, it is done at 3 months. In some centers, lip repair is carried out immediately after birth. The problem with immediate repair is that at birth the liver function is not completely developed which will compromise haemostasis. These patients are usually given supplements to enhance haemostasis.

Palatal repair is delayed because if it is done early on, it will result in growth interferences, so it is delayed until the patient is one and a half to two years old.