Pulled elbow occurs in approximately 1% of children, with toddlers being particularly at-risk. Nearly 50% of patients have no obvious history of pull or trauma. The child typically presents with pseudoparalysis of the forearm with the elbow held in slightly flexed, pronated position and with guarding.
commonly referred as ‘maladie de Mouchet’ in European literature. The term ‘tardy ulnar palsy’ was introduced in English literature by Hunt.

**Question 5**

a. The diagnosis is non-union fracture of the lateral condyle of the humerus.

b. This complication is usually caused by failure to diagnose type-2 lateral humeral condyle fracture and inadequate primary treatment of either type-1 or type-2 lateral humeral condyle fracture.

c. There is no consensus on the treatment of these complications. Recommendations include osteosynthesis for non-union and corrective osteotomy of the distal humerus after malunion for significant deformity. Early non-union (less than 6 months) can be treated similarly to an acute fracture by fixing the posteriorly based Thurston-Holland fragment to the distal humerus with the caveat to avoid posterior dissection or stripping of soft tissue attachments to the fragment in order to preserve blood supply and prevent avascular necrosis. Late non-unions with 10mm displacement or more should be fused in-situ to the metaphysis as the fragments remodel and anatomical reduction would not be possible. Screw fixation is optional. For cases of asymptomatic late non-unions with less than 10mm displacement, leaving the non-union alone has been recommended. Ulnar nerve palsy is addressed by either decompression in-situ or anterior transposition in combination with corrective osteotomy.

**NON-UNION OF LATERAL HUMERAL CONDYLE FRACTURES**

Lateral humeral condyle fractures are the most common physeal injuries around the elbow. They account for 10% to 15% of all elbow fractures in children aged 6- to 10-years-old. The mechanism of injury involves a varus stress with the elbow in extension. The fracture is basically a Salter-Harris type-4 injury. It may occur during elbow dislocation. A child with pre-existing cubitus varus is at-risk to develop fracture of the lateral condyle.

The main problem related with the development of non-union is failure to differentiate between the stable type-1 fracture with an intact central cartilage hinge (incomplete fracture) and the unstable type-2 fracture (complete fracture). Standard anteroposterior and lateral radiographs are not helpful as the cartilaginous part is not visualised. Internal oblique view shows the fracture best. The best clue is by measuring the displacement or widening of the central fracture section at the cartilage-bone junction. Any widening or displacement of less than 2mm indicates an incomplete or a relatively stable fracture (type-1) with an intact cartilage hinge. Treatment of type-1 fracture requires immobilization in a long-arm cast with the elbow in 80-90 degrees of flexion for four weeks and regular cast-free radiographic follow-ups to assess maintenance of reduction. Any displacement requires re-reduction and internal fixation to prevent re-displacement.

Unstable type-2 or type-3 (displacement of more than 5mm and rotated fracture fragment) fractures are unique for the risk of non-union and are thus indicated for open reduction and internal fixation. Fixation from metaphysis-to-metaphysis using screws or epiphysis-to-epiphysis using smooth pins or Kirschner wire is recommended. Inadequately treated fractures are at risk for malunion and non-union with subsequent deformity, loss of motion and tardy ulnar palsy.

**Question 6**

a. A chronic stable slipped capital femoral epiphysis (SCFE) based of more than 2 weeks symptoms of ability to walk and referred pain.

b. Chronic SCFE of mild grade based on the appearance of metaphyseal corner resorption and slip angle of less than 30 degree on true lateral radiographic view. Hip ultrasonography is helpful to verify metaphyseal corner roundness, filling defects in the epiphyseal plate and calcification of the fibrocartilage ligaments.

c. Referred pain through the obturator nerve. The motor branch, which supplies the muscle that moves the hip and knee, also supplies the skin over the joints. This rule is known as the Hilton law.

d. Treatment for mild chronic SCFE consists of, epiphysiodesis by in-situ pinning to prevent further slippage during acute-on-chronic slip episodes. This can be achieved by using a single reverse-cutting cannulated screw inserted percutaneously according to Canale technique.

e. Femoroacetabular impingement (FAI) is a commonly encountered complication in cases such as this.

**SLIPPED CAPITAL FEMORAL EPIPHYSIS**

Emphasizing ‘primum non nocere’ by preventing avascular necrosis and chondrolysis is the current standard of treatment for SCFE. In addition to the standard classification of SCFE into acute, chronic and acute-on-chronic types based on the duration of symptoms, classification based on physeal stability as determined by walking ability (Loder et al.1993) and hip ultrasonographic features (Kallio et al. 1993) helps to guide surgical decision making.

In chronic stable SCFE, percutaneous in-situ single screw fixation remains the gold standard for treatment option, as the risk of avascular necrosis is low. The concepts of treatment for acute unstable SCFE with high risk of avascular necrosis continue to evolve with an enormous body of evidence appear to suggest that early decompression of associated hip effusion, gentle reduction and fixation with two screws reduces the risk of avascular necrosis. Reduction of slip may occur spontaneously from positional manipulation or from gentle traction while the affected limb is being positioned on the operating table for screw fixation.