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RESEARCH ARTICLE

LONG-TERM RESULTS OF RECHANGES UNCONVENTIONAL PROSTHETIC PARTS SERIAL TO CONSERVE PELVIC LIMB BECAUSE OF OSTEOSARCOMA

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ABSTRACT

Presentation of the case. The case of a 25 year old woman diagnosed with osteosarcoma of the left proximal tibia is described, which was treated with en bloc resection with a non-conventional prosthesis operated at 8 years old at the Children's Hospital of Mexico; It first required replacement prosthesis at the age of 12 years, the second at 15 years old. At 17 years of age presents new material failure remaining 2 years without support. The patient goes to the consultation of bone tumors at the Naval Medical Center at the age of 19 years to develop a massive metallosis with skin pigmentation and localized edema in his left knee, so new tumor prosthesis is placed. Subsequently patient evolved satisfactorily without data infection, rejection or tumor reactivity prosthesis; The patient is now independent of their daily activities. It indicates that the failure of the prosthesis should be tried revision surgery as soon as possible, discard any infectious process or reaction osteosynthesis material, to avoid injury to soft tissue.

INTRODUCTION

Osteosarcoma is defined as a malignant spindle cell sarcoma characterized by its production of osteoid matrix, is reported as the común1 primary malignant bone tumor. Each year about 6 cases are diagnosed at the Naval Medical Center and about 15 cases per year in the service of bone tumors Orthopedic Hospital, Dr. Victorio de la Fuente Narváez Medical Unit of High Specialty (UMAE) Institute Mexican Social Security (IMSS) in the City of Mexico (Viveganthan *et al.,* 2014). In the world the prevalence of osteosarcoma 5 is estimated at 6% of malignancy in childhood and 10% of solid bone tumors, is the most common cause of primary bone cancer with an incidence of 2 to 3 / million inhabitants / year between 15 to 19 years[2]. In Mexico it occurs between 0.6% and 0.8% in men and between 0.3% and 0.4% in women is more common in adolescents. Previously he was with high mortality despite the radical amputation receiving these patients; however with the use of neoadjuvant therapies such as chemotherapy, it has become the mainstay of treatment because it is associated with tumor response and prognosis (Keene and Oakeshott, 2011). The total replacement of the femur is an alternative in the treatment of reconstruction in patients with bone cancer conditions survival of these patients has improved interdisciplinary treatment, by controlling systemic diseases, delimiting tumor and extensive tumor resection with application modular joint replacements system, which enables preservation of the limb. Reported complications of implants are wound infections, perimplant fracture and fatigue metallosis material or loosening thereof. Metallosis is a major complication which is defined as a soft tissue infiltration periprosthetic bone and metal debris It manifested as aseptic fibrosis, local necrosis or a secondary implant loosening of corrosion metálica (Willis-Owen *et al.,* 2011; Helito *et al.,* 2014). Signs of metallosis include osteolysis, tissue necrosis, pseudotumor formation and loosening prótesis (Yoshida *et al.,* 2012; Pala *et al.,* 2015). There is a thickening of the joint capsule, and this results in a restricted range of movement. The enriched liquid metal causes waste spill in articulación (Viveganthan *et al.,* 2014; mLangton *et al.,* 2011). This enriched fluid waste transports and deposits metal over the entire junction, leading to soft tissue pigmentation, inflammation, pain and effusion articular (Jayasekera *et al.,* 2015). Metallosis causes progressive destruction of the prosthetic construct and soft tissue to allow the mobilization of protesis[11], is for them that we emphasize the need for early diagnosis and revision surgery. One case report of a patient with chondroblastic and metallosis osteosarcoma long-term monitoring to which underwent pelvic limb salvage occurs.

CASE REPORT

Female patient 8 years old who attends the Naval Medical Center in 2002, with no history of importance, which

chondroblastic osteosarcoma is diagnosed in left proximal tibia which was treated with intraarticular resection and a modular prosthetic replacement of the distal femur and proximal tibia, with no immediate complications at Children's Hospital of Mexico; then it is sent to receiving adjunctive therapy with cisplatin and adriamycin chemotherapy. Tracking is given outpatient every 3 months, no alarm data or late complications. In June 2006 patient has severe pain in area proximal tibia without direct contusion, pain start just to be walking, go to assessment and diagnosed with failure tibial prosthesis component, so the first replacement is performed the same. In October 2009, the patient suffers a car accident with direct trauma to the lower left limb. Radiography showed a failure of osteosynthesis material level again left proximal tibia, so the first replacement tumor prosthesis was performed. Year 2011 the patient is picked up at the Naval Medical Center by going to valuation bone tumors service, Prosthesis failure data is again detected in proximal tibia area without traumatic event (Fig.1). However, the patient performs the march with partial support independently with the support of crutches and moderate pain, which replacement prosthesis indicated, however postpones surgical procedure the patient two years to present pregnancy.

In April 2013, arrives at traumatology and orthopedics in the area of bone tumors of the Naval Medical Center in Mexico City for reevaluation by presenting increasing pain in his left knee, tumor in the anterior and lateral knee changes skin color with sign metal line, arcometria limited to flexographic extension and length discrepancy lower limb (Fig. 2). Positron emission was performed postitrones - Computed Tomography (PET SCAN) the results showed tumor dormancy. Radiographic evaluation revealed that the left pelvic limb was 2 cm shorter than the right; plain radiographs with suspected of metallosis presence of radiopaque line "cloudy sign" a thin edge higher linear density in the region of the suprapatellar pouch. scintigraphy is performed with labeled leukocytes remain negative for infection. In laboratory tests they leukocytes 9,200 cells were mm3, C-reactive protein (PCR) of 55 mg / L, and erythrocyte sedimentation rate (ESR) of 38 mm / h. He proposed to patient surgical intervention, which agreed to be scheduled for review in July 2013 to Removal unconventional tumor prosthesis solicitation more proximal tibia placing new unconventional tumor prosthesis and bone grafting autologous. Anterolateral approach on previous incision is made. Unconventional prosthesis which is broken at the level of the tibial component is located. The knee revision surgery confirmed the presence of a massive metallosis soft tissue of the distal femur and proximal tibia (Fig. 3). Preventing localization and differentiation of anatomical structures due to staining of soft tissue, so debridement pigmented edges is performed. new prosthesis is placed Unconventional tumor and autologous bone graft without complications and confirming proper placement by conventional radiography (Fig.4), as well as clinical trials gooseneck extension in the operating room to determine which components were properly oriented (Fig. 5). Periprosthetic tissue samples knee were extracted muscular and skeletal sites, sending pathology tissue for study. Pathologic examination of soft tissue, muscle and bone showed large necrotic areas surrounded by a reactive fibrosis. Existence of black and irregular metal particles were associated with granulomatous reaction dense. Thepatient recovery was successful and without complication. His rehabilitation included quadriceps strengthening, resumption of gait, muscle analgesia, which began the second postoperative day. The patient was discharged from hospital without complications after 10 days. At the last follow, in June 2017 the patient had joint knee stable and pain, with proper healing (Fig. 6). He continued rehabilitation, gait assessment with support walker, knee flexion 60 °. scintigraphy was performed with labeled leukocytes demonstrating absence of infection. Our patient was informed that data obtained from their case would be submitted for publication and authorized with a signed written informed consent.

DISCUSSION

Unconventional prosthetic reconstruction cementless with locking bolts after tumor resection of the distal femur and proximal tibia described successfully in 75% of patients. Reviewing tumor knee prosthesis due to breakage tibial or femoral component is indicated immediately way (Langton *et al.,* 2011). The most common reason implant failure is aseptic loosening followed by the failure of the implant and infección5. Metallosis represents a rare complication (Common) after failure of secondary tumor prosthesis to break components. Since the metallosis consists of the deposition of metallic debris in the periprosthetic soft tissue affecting capsule or joint cavity, and extraarticulares tissues (Jayasekera *et al.,* 2015). Deposition of waste from the prosthesis to the periarticular soft tissue can cause pain and systemic effects, but also can be asymptomatic, manifesting only with skin pigmentation. In case of failure of the prosthesis, an early review is recommended. In this particular case the patient decides to wait for surgery for a year and a year later pregnancy, so she received a late review which resulted in a massive deposition of metals in soft tissues. The patient had a large area of skin metallosis characterized by skin pigmentation lining the joint space of the affected limb.

The patient only accept surgery by local symptoms of pain and increase in limiting knee flexion. Metallosis was suspected radiographically by their typical appearance: "sign cloud" that are periprosthetic amorphous densities of the soft tissue, the "sign of the metal line," a thin edge higher linear density in the region of the suprapatellar pouch and the "sign bubble", a curvilinear radiodensity delimiting the articulación13. revision surgery revealed massive infiltration of muscle and soft tissue metals (Kinds *et al.,* 2012; Ho *et al.,* 2018). After 3 months of assisted rehabilitation, the patient returned to their activities, start of the march with support walker. Currently the patient is uncomplicated. General and imaging studies were normal and no evidence of tumor or infectious reactivation.

Conclusion

Although the appearance of metallosis is rare in tumor prosthesis, due to the age of the patient by high activity not restricted as in the adult, may occur more frequently loosening the material, failure thereof and therefore the metallosis appearance. Osteosarcoma is a malignant tumor that ranks first in bone tissues and mortality, despite the neo and adjuvant treatments, the rate of death is 50 to 60%.This patient according to statistics is a survivor with good response to chemotherapy, so wide resection was performed and joint replacement; currently achieving kept free of tumor.

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Ethical approval: We have a patient's consent. We have not presented the case to the Ethics Committee approval.

Consent: No data to patient identification.

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ANNEXES

Fig. 1. Radiography anteroposterior and lateral left foot with tumor prothesis fatigue seen in proximal tibial component. 2009

Presence of radiopaque line ("clear sign"), and the "sign of the metal line," a thin edge higher linear density in the region of the suprapatellar pouch.

Fig.2. image shown in discoloration (discoloration) in the lateral skin left knee.

Fig. 3. In the surgical approach He confirmed the presence of a massive metalosis soft tissue of the distal femur and proximal tibia. Noting the little difference of soft tissue by infiltration metal.

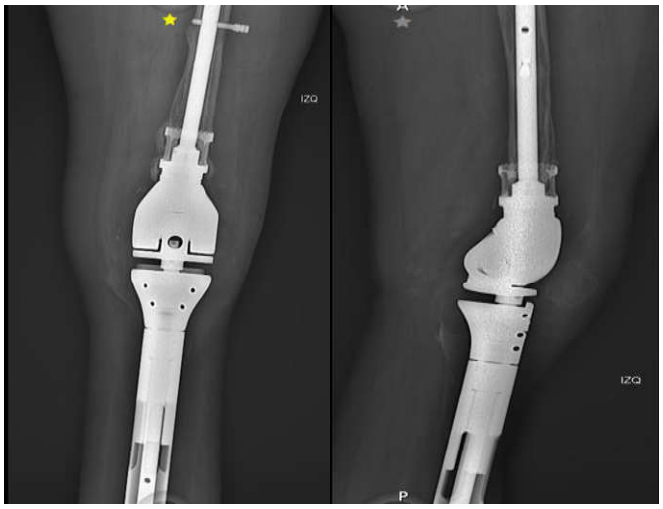

Fig. 4. anteroposterior and lateral left foot Radiography, unconventional new tumor prothesis is observed. Note the soft tissue suitable radiolucides knee level. Definitiva

Fig.5. Clinical flexion tests to determine the orientation of the components.

Fig. 6. Observe adequate healing and no change in skin color.

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