TITLE OF OPERATION: ,1. Incision and drainage with extensive debridement, left shoulder.,2. Removal total shoulder arthroplasty (uncemented humeral Biomet component; cemented glenoid component).,3. Implantation of antibiotic beads, left shoulder.,INDICATION FOR SURGERY: , The patient was seen multiple times preoperatively and found to have findings consistent with a chronic and indolent infections. Risks and benefits have been discussed with him and his family at length including but not exclusive of continued infection, nerve or artery damage, stiffness, loss of range of motion, incomplete relief of pain, incomplete return of function, fractures, loss of bone, medical complications, surgical complications, transfusion related complications, etc. The patient understood and wished to proceed.,PREOP DIAGNOSIS: , Presumed infection, left total shoulder arthroplasty.,POSTOP DIAGNOSES: ,1. Deep extensive infection, left total shoulder arthroplasty.,2. Biceps tenosynovitis.,3. Massive rotator cuff tear in left shoulder (full thickness subscapularis tendon rupture 3 cm x 4 cm; supraspinatus tendon rupture 3 cm x 3 cm; infraspinatus tear 2 cm x 2 cm).,DESCRIPTION OF PROCEDURE: ,The patient was anesthetized in the supine position, a Foley catheter was placed in his bladder. He was then placed Beach chair position and all bony prominences were well padded. Pillows were placed around his knees to protect his sciatic nerve. He was brought to the side of the table and secured with towels and tape. The head was placed in neutral position with no lateral bending or extension to protect the brachioplexus from

any stretch. Left upper extremity was then prepped and draped in usual sterile fashion. Unfortunately, preoperative antibiotics were given prior to the procedure. This occurred due to lack of communication between the surgical staff and the anesthesia staff. The patient's extremity, however, was prepped a second time with a chlorhexidine prep after he had been draped. Also, Ioban bandages were placed securely to the skin to prevent any further introduction of infection into his shoulder.,Deltopectoral incision was then made. The patient's had a cephalic vein, it was identified and protected throughout the case. It was retracted laterally and once this has been completed, the deltopectoral interval was developed as carefully as possible. The patient did have significant scar from this point on and did bleed from many surfaces throughout the case. As a result, he was transfused 1 unit postoperatively. He did not have any problems during the case except for one small drop of blood pressure. However this was due primarily because of the extensive scarring of his proximal humerus. He had scar between the anterior capsular structures and the conjoint tendon. Also there was significant scar between the deltoid and the proximal humerus. The deltoid was very carefully and tediously removed from the proximal humerus in order not to damage the axillary nerve. Once the plane between the deltoid and underlying tissue was found, the proximal humerus was discovered to have a large defect, approximately 4 x 3. This was covered by rimmed fibrous tissue which was fairly compressible, which felt to be purulent, however, when the needle was stuck into this area,

there was no return of fluid. As a result, this was finally opened and found to have fibrinous exudates which appeared to be old congealed, purulent material. There was some suggestion of a synovitis type reaction also inside this cystic area. This was all debrided but was found to track all the way into the proximal humerus from the lateral femoral component and also tracked posteriorly through and around the posterior cortex of the proximal humerus indicating that the infraspinatus probably had some tearing and detachment. This later proved to be the case and infraspinatus did indeed have a tear 2 cm x 2 cm. All of the mucinous material and fibrinous material was removed from the proximal humerus. This was fairly extensive debridement. All of this was sent to pathology and also sent for culture and sensitivity. It should be noted that Gram stain became as multiple white blood cells but no organism seen. The pathology came back as fibrinous material with multiple white cells, also with signs of chronic inflammation consistent with an infection.,Attention was then directed towards the anterior structures to gain access to the joint so that we could dislocate the prosthesis and remove it. There was also cystic area in the anterior aspect of the shoulder which was fairly fibrinous. This was also removed. Once this was removed, though the capsule was found to be very thin, there was essentially no subscapularis tendon whatsoever. It should also noted the patient's proximal humerus was subluxed superiorly so that there was no supraspinatus tendon present whatsoever. As a result, the biceps tendon was finally identified just below the pectoralis

tendon insertion. The upper 1 or 2 cm of the pectoralis insertion was released in order to find the biceps. It was tracked proximally and transverse ligament released. The biceps tendon was flat and somewhat erythematous. As a result, it released and tagged with an 0 Vicryl suture. It was later tenodesed to the conjoint tendon using 2-0 Prolene sutures. The joint was then entered and noted significant synovitis throughout the entire glenoid. This was all very carefully removed using a rongeur and sharp dissection.,Next, the humeral component was removed and this was done by attempting to remove it with the slap hammer and device which comes with the Biomet set. Unfortunately, this device would not hold the proximal humerus and we could not get the component to release. As a result, bone contact of the metal proximally was released using a straight osteotome. Once this was completed, another attempt was made to remove the prosthesis but this only resulted in fracture of the proximal humerus through the areas of erosion of the infection and once this has been completed, we abandoned use of that particular device and using a _____ , we were able to hit the prosthesis lip from beneath and essentially remove it. There was no cement. There was exudate within the canal which was removed using a curette.,Using fluoroscopy, sequential reamers were placed to a size of 11 distally down the shaft to remove the exudate. This was also thoroughly irrigated with irrigation antibiotic, and impregnated irrigation to decrease any risk of infection. It should be noted that the reaming was done fluoroscopically to make sure that there

was no penetration of the canal at any point.,The attention was then directed to the glenoid. The glenoid component was very carefully dissected free and found to be very loose. It was essentially removed with digital dissection. There was no remaining cement in the cavity itself. The patient's glenoid was very carefully debrided. The glenoid itself was found to be very cup shaped with significant amount of bone loss in the central portion of the canal itself. This was debrided using rongeurs and curette until there was no purulent exudate present anywhere in the glenoid itself.,Next, the entire wound was irrigated thoroughly with 9 liters of antibiotic impregnated irrigation. Rather than place a spacer, it was elected to use antiobiotic beads. This was with antibiotic impregnated cement with one package with 3 gram of vancomycin. These beads were then connected using Prolene and placed into the glenoid cavity itself, also some were placed in the greater tuberosity region. These three did not have a Prolene attached to them. The ones placed down the canal did have a Prolene used as did the ones placed in the cavity of the glenoid itself.,The biceps tendon was then tenodesed under tension to the conjoint tendon. There was essentially no capsule left purely to close over the proximal humerus. It was electively the proximal humerus. A portion of bone intact because it did have some bleeding surfaces. Deltopectoral was then closed with 0-Vicryl sutures, the deep subcutaneous tissues with 0-Vicryl sutures, superficial subcutaneous tissues with 2-0 Vicryl sutures. Skin was closed with staples. A sterile bandage was applied along with a cold therapy device and

shoulder immobilizer. The patient was sent to recovery room in stable and satisfactory condition.,It should be noted that _____ is being requested for this case. This was a significantly scarred patient which required extra dissection and attention. Even though this was a standard revision case due to infection, there was a significant more decision making and technical challenges in this case and this was present for typical revision case. Similarly, this case took approximately 30 to 40% more length of time due to bleeding and the attention to hemostasis. The blood loss and operative findings indicates that this case was at least 30 to 40% more challenging than a standard total shoulder or revision case. This is being dictated for insurance purposes only and reflects no inherent difficulties with the case whatsoever.