

# Hip Disarticulation, report of 3 Cases and Literature Review:

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## Abstract

Hip disarticulation is a rarely performed procedure and few surgeons are expert in doing it, the operation may be needed urgently for a sick unstable patient.

We present three cases of hip disarticulation for sever infection, vascular disease and chondrosarcoma in which we were involved over a short period of time and a literature review to discuss the success and mortality of this procedure.

Hip disarticulation accounts for 0.5% of lower extremity amputations and mostly performed for malignant musculoskeletal tumors, limb ischemia, infections and trauma. It has a poor functional outcome but it may be the only available option to cure the patient or save his life.

Hip Disarticulation is a major complex surgery and should be part of the armamentarium of the orthopaedic surgeon who is treating severe lower limb infections, dealing with lower limb sarcomas and peripheral vascular diseases. It is a major procedure for the patient. It should not be undertaken lightly and patient and surgeon need to know the likely outcome.

**Keywords:** Hip, Disarticulation.

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## Introduction

Hip disarticulation is not a common procedure. It is mostly performed for malignant musculoskeletal tumors, limb ischemia, severe trauma, and rarely infection<sup>(1)</sup>.

Mortality after hip disarticulation remains controversial. This procedure is infrequently performed and few orthopedic surgeons have expertise or familiarity with the procedure. Furthermore, the complexity of the procedure and the high mortality rates reported by some

authors<sup>(2,3)</sup> may create reluctance on the part of the treating surgeon to perform the procedure, especially as an emergent procedure on a patient with hemodynamic instability and medical problems, as in the case of necrotizing infections or acute lower limb ischemia.

We were involved in 3 cases of hip disarticulation over a short period of time one as a consult from our general surgery department (case 1), one as a consult from our vascular surgery team (case 2), and one patient from our outpatient department (case 3).

### Case one:

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53 year old female patient ,with multiple medical co-morbidities (diabetes mellitus, hypertension, ischemic heart disease with multiple coronary arteries stenting, history of transient ischemic Attacks and previous nephrectomy and Thyroidectomy) admitted with left thigh and buttock ulcers and gas gangrene as a complication of perianal abscess surgery.

She had local debridement three times which failed to control the infection and the

decision was taken to do hip disarticulation.

Intra operatively we were not able to remove all dead tissue due to extension of the gangrene to the trunk and the patient had 3 times debridement later on.

She was kept on mechanical ventilator for hemodynamic instability due to septic shock and she developed upper gastrointestinal bleeding and died 13 days after hip disarticulation.



**Fig 1. X-ray of the femur and tibia of a patient with extensive involvement with enchondromas due to Ollier's Disease**

**Case two:**

75 year old male patient, with multiple medical co- morbidities (heavy smoker, ulcerative colitis, rheumatoid arthritis, hypertension, ischemic heart disease, and atrial fibrillation). Had severe peripheral vascular disease with history of angioplasty of left common iliac artery, internal iliac artery,

external iliac artery, superficial femoral artery 10 years before this admission. He had aortobifemoral bypass and left below knee amputation 9 years before this admission.

He was admitted with acute right lower limb ischemia which was treated initially with thrombectomy, fasciotomy, and interventional angioplasty.

He had magnetic resonance arteriography which revealed complete occlusion of the aorta below the renal arteries.

He underwent right hip disarticulation, which was complicated by ischemic flap necrosis and sacral pressure sores and he remained in the intensive care unit for 2 months and deteriorated slowly developed acute renal failure, severe depression and died.

### **Case three:**

53 year old male patient, with no medical co-morbidities, known case of OLLIER'S disease (Multiple enchondromatosis) with severe left femur and tibia deformities. [fig. 1].

He presented with left distal femur pain, multiple open biopsies were taken with no evidence of malignant transformation.

He refused hip disarticulation as a treatment for his severe deformity and pain . he lost to follow up for one year and came back with more severe pain .

He had left hip disarticulation with uneventful recovery and discharged home 7 days after the operation and was able to drive his own automatic car.

Histopathologic examination revealed chondrosarcoma of the distal femur.

2 years later on, he developed lung metastasis.

### **Discussion:**

Hip disarticulation accounts for only 0.5% of lowerextremity amputations in the United States and is mostlyperformed for malignant musculoskeletal tumors, limbischemia, and severe trauma<sup>(1)</sup>.

Hip disarticulation forsevere infections of the lower extremity is rarely performedbut has been described for gangrene<sup>(4,5)</sup>, necrotizingfasciitis<sup>(6,7)</sup>, infection following hip arthroplasty<sup>(8)</sup>, extensive osteomyelitis of the

proximal femur<sup>(3)</sup>, infectedvascular grafts<sup>(9)</sup>, and severe decubitus ulcers inparaplegics<sup>(10)</sup>.

Hip disarticulation represents approximately 1% of Admissions in Roehampton Rehabilitation Unit–(UK)— The indications for admissions were : Tumors 56%, Trauma 15% ,Vascular 11%, Infections 11%, and congenital 7%.<sup>(11)</sup>

Mortality rates following hip disarticulation have varied considerably in the literature.

Pack reported no operative deaths in 96 patients who underwent the procedure for malignant tumors<sup>(12)</sup>, and similarly Fenelon et al. had no deaths in 11 patients who had hip disarticulation for severe infections following hip arthroplasty<sup>(8)</sup>.

However, Unruh et al. reported an overall 44% mortality rate in their series of 34 patients, which was higher in the presence of infection; 12 of 23 patients with preoperative infection died compared to three of 11 patients without infection , specifically, two of nine patients with femoral osteomyelitis died, six of 10 died with limb ischemia and infection, and four of four died with lower extremity trauma and infection<sup>(3)</sup>.

In the series of Endean et al., the mortality was 33% (10 of 30 patients) when hip disarticulation was performed emergently, compared to 4% (one of 23 patients) when it was performed electively<sup>(2)</sup>. These large variations in mortality among studies and within subgroups of the same study may be attributed to variability in indications for the procedure and condition of the patient.

Emergently performed procedures may be associated with systemic instability of the patient.

The diagnosis of limb ischemia may result from acute vascular trauma and be associated with hemodynamic instability, or it may result from peripheral vascular disease, in which case

heart disease may coexist.

Endean et al. reported the presence of heart disease was notably associated with postoperative mortality<sup>(2)</sup>.

In the series of Zalavras et al. when performed emergently six of seven patients survived while eight of eight survived when the procedure was performed electively for severe infections.<sup>(13)</sup> and they presumed that the expertise and multidisciplinary care available at their institution may have been a contributing factor to the low mortality in their series.

Two of the three cases we present who had the operation urgently died in the early post operative period in the intensive care unit. The third cases who had the operation electively survived for two years with relatively good functional outcome.

Disarticulation of the hip for malignant tumours is a rare operation. There have been major improvements in case selection, imaging, chemotherapy and surgery which have resulted in limb salvage being the norm for most sarcomas of the thigh.<sup>(14-17)</sup> Disarticulation of the hip is still needed, however, in situations, where the tumor is deemed inoperable by limb salvage due to extensive involvement of critical structures such as the femur, the neurovascular bundle, the sciatic nerve or a large proportion of the muscle bulk of the thigh.<sup>(15-17)</sup> Tumors resulting in a pathological fracture of the femur may necessitate amputation if there is very extensive contamination of surrounding soft tissues.<sup>(19)</sup> Amputation through the hip will not be carried out in the presence of incurable disease such as the presence of metastases or lymph node involvement unless there is no other alternative for palliation.

R. Jain et al. in a series of eighty patients who had hip disarticulation for sarcomas reported an overall survival following the amputation of 56% at 1 year, 39% at 2 years, 27% at 5 years and 21% at 10 years.

The 5-year survival of patients having the amputation as a primary procedure was 32%, for those with local recurrence it was 25% whilst for those with a palliative amputation it was nil.

Local recurrence developed in 10 patients following the amputation, and was related to close margins of excision; all of these patients subsequently died. Function was on the whole poor, with only one surviving patient regularly using an artificial limb<sup>(19)</sup>.

The third case we present in which the patient had extensive involvement of the bones of the lower limb with multiple enchondromas with malignant transformation he had uneventful recovery with the ability to continue working and no local recurrence till he died of lung metastasis.

Disarticulation of the hip for infection around a total hip replacement may be the only option in the presence of severe life threatening infection and severe bone loss especially after multiple attempts of exchange arthroplasty. FENELON et al reported 11 patients with Disarticulation of the hip for severe infection with no perioperative mortality<sup>(8)</sup> and the functional outcome varied greatly.

We could not find any case of hip disarticulation after hip arthroplasty in our hospital.

Hip disarticulation is a major ablative procedure resulting in cosmetic problems, discomfort when wearing the prosthesis, and difficulty with walking.

Energy consumption during walking increases by 82% in patients with hip disarticulation compared to normal individuals<sup>(20)</sup>.

As a result, a patient may lose his/her ability to walk and may become wheelchair dependent.

Unruh et al. reported only four of 19 survivors in their series ambulated with a walker, whereas 12 used a wheelchair and three were confined to bed<sup>(3)</sup>. However, the procedure is performed as a life-saving

measure for elimination of an extensive infectious process for which no other satisfactory treatment exists<sup>(8)</sup>.

Hip Disarticulation is a major complex surgery and should be part of the armamentarium of the orthopaedic surgeon who is treating severe lower limb infections, dealing with lower limb sarcomas, and peripheral vascular diseases. It is a major procedure for the patient. It should not be undertaken lightly and patient and surgeon need to know the likely outcome.

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## حز مفصل الورك: تقرير عن ثلاث حالات ومراجعة للأدب الطبي

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### الملخص

نادراً ما تنشأ الحاجة إلى إجراء عملية حز مفصل الورك (بتر الطرف السفلي من مفصل الورك) وعدد قليل من الجراحين لديه خبرة واسعة في إجراء هذه العملية التي قد تنشأ الحاجة إليها بشكل طارئ لمريض في حالة حرجة.

في هذا التقرير نقدم تقريراً عن ثلاث حالات لمريض تم حز مفصل الورك لهم بسبب وجود التهاب خمجي شديد في الأول وبسبب نقص تروية الدم للطرف السفلي في الثاني، وبسبب ورم غضروفي خبيث في الثالث. ومن ثم نقدم مراجعة للأدب الطبي لمناقشة فائدة هذه العملية والنتيجة الوظيفية المتوقعة، واحتمالات الوفاة بعدها.

تشكل عملية حز مفصل الورك حوالي 0.5% من عمليات البتر في الأطراف السفلية، وفي غالب الأحيان تجرى بسبب وجود ورم خبيث أو نقص في تروية الدم أو التهاب خمجي شديد أو في حالات الإصابات الناتجة عن الحوادث الشديدة. وبالرغم من ضعف النتائج الوظيفية بعد هذه العملية، إلا أنها قد تكون الخيار الوحيد لشفاء المريض أو إنقاذ حياته.

تعد عملية حز مفصل الورك عملية كبرى ومعقدة، ولكنها جزء مهم من ممارسة الطبيب الذي يعالج هذه الحالات الصعبة. كما أنها عملية كبرى بالنسبة للمريض، وعلى الطبيب والمريض إدراك النتائج المتوقعة لهذه العملية.

الكلمات الدالة: الورك، حز المفصل.