

Neglected hip fracture dislocation in young adult treated with total hip arthroplasty and bone graft

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Abstract

Background: Hip fractures is estimated to occur in 176/100.000 population in Indonesia. Inadequate treatment or over negligence of hip fractures will result in significant morbidity. Bone graft can be added to support acetabular bone loss but the concept is still early. Here presented a unique neglected cases of hip fracture dislocation, treated with Total Hip Arthroplasty (THA) augmented with bone graft.

Case Report: A-26-year-old female came to the outpatient clinic with chief complaint of pain on left hip. The pain intensified the last two weeks on her left hip and worsens upon weight-bearing. The patient has had a motor vehicle accident 8 months ago where her hip was not treated due to lack of funding. On physical examination, pain on palpation and limited ROM was observed. The patient was then planned for THA with posterior approach. Acetabular bone loss was filled with bone graft. Postoperative, the patient regained her walking capability and the pain subsided. Postoperative hip radiograph showed an optimally placed acetabular implant with inclination of 36.1° on the normal side and 42.3° on the THA side, CORA (center of rotation angulation) 100 mm on the normal side and 99 mm on the THA side from midline, and 79 mm on the normal side and 81 mm on the THA side from trans sacrogluteal line.

Discussion: Few literatures describe neglected hip fracture dislocation cases. Neglected hip fracture dislocation causing joint incongruity and cartilage damage, with osteoarthritis risk increased. Some authors described THA as a treatment of choice. Type of surgical treatment, approach, and implants needs to be adjusted to the patient's lifestyle and condition to achieve satisfactory result. Posterior approach has the advantage of being able to directly access the fracture dislocation site. Bone grafting can be used in THA as a structural buttress. In this case, femoral head was used to augment posterior column and acetabular wall. Cementless acetabular implant is the treatment of choice for young patients.

Conclusion: Total hip arthroplasty augmented with bone graft is a viable and recommended treatment option for neglected hip fractures or hip fractures in general.

Keyword: Total Hip Arthroplasty; Neglected; Hip Fracture Dislocation

1. Introduction

Most hip dislocations that occur in adults are treated by open reduction and internal fixation (ORIF) but it is rare case when the hip dislocations have been neglected for more than a year. However, in some places where traditional bone setters are still in use, a neglected hip dislocation may be found. Because of the rarity of this situation, there is not a lot of information available on how to treat it ¹. If someone has a hip dislocation, they may not go to the doctor very often because it hurts a lot and they might not be able to tell the doctor what's wrong. This can happen to people who are very pain tolerant or who have a low level of intelligence or who have other injuries that are more obvious or life-threatening ².

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After a person has a trauma, they may often go to the hospital many days later. This is because they may have received alternate therapy before. In cases of neglect dislocation of the hip, the acetabulum (the socket where the hip bone fits) can become filled with fibrous tissue, making it difficult to reduce the dislocation ². If a hip dislocation is not treated right away, it can lead to bone necrosis and arthritis. A total hip replacement is often the best treatment for hip dislocations that have been neglected for more than three months ².

Total hip replacement (THR) or total hip arthroplasty (THA) is a common treatment for people with advanced hip arthritis. The National Joint Registry reports that there were 89,000 hip replacements in the UK in 2012 and more than 250,000 hip replacements in the US in the same year. The number of hip replacements is increasing over time, and this is especially true for people with advanced arthritis. Large bone defects in the hip are often the result of late presentation of inflammatory arthritis, post-infectious or post-traumatic symptoms. Revision hip surgery is often necessary to treat these defects. Bone grafts can be used to repair the bone defects in the hip ³. In this study we report a case of a young female with neglected fracture dislocation acetabular.

2. Case presentation

A-26-year-old female came to the outpatient clinic with chief complaint of pain on left hip. The pain intensified the last two weeks on her left hip and worsens upon weight-bearing. The patient has had a motor vehicle accident 8 months ago, dislocated her hip and didn't go to the hospital due to lack of funding. Several months before, she also involved in motor accident where her left tibia and distal radius was treated with internal fixation in the same hospital. Then, 4 months after the last motor vehicle accident, she felt her hip was became shorter without any pain. Next month, the patient barely can't walk, even though she didn't feel any pain.



Figure 1 X-ray of the left wrist joint and left lower leg



Figure 2 X-ray of the pelvic and 3D CT-scan of the pelvic

The primary survey is stable with no remarkable injury. After a brief physical examination, there is a stitch scar on the distal area of the forearm, on the proximal anterior side of the lower leg with notable LLD in the left leg. Also, there is

pain on palpation and limited ROM was observed on left hip area. There was no other significant conditions and no history of drugs and smoke. The plain X-ray of pelvic, lower leg, wrist joint and pelvic CT-Scan is done for evaluate the condition of her left hip, left tibia and her wrist joint. From the previous X-ray confirm the internal fixation in the proximal tibia and the distal radius region (Figure 1). From the pelvic X-ray and CT-Scan, it was found that the left femoral head dislocated into the posterosuperior area of the iliac bone (Figure 2). The patient the diagnosed with left neglected fracture dislocation of the acetabulum.

The patient was then planned for THA with posterior approach. Acetabular bone loss was filled with bone graft. Postoperative, the patient regained her walking capability and the pain subsided. Postoperative hip radiograph showed an optimally placed acetabular implant with inclination of 36.1° on the normal side and 42.3° on the THA side, CORA (center of rotation angulation) 100 mm on the normal side and 99 mm on the THA side from midline, and 79 mm on the normal side and 81 mm on the THA side from trans sacrogluteal line (Figure 3). Two weeks after this procedure, in the OPD, there is no significant complaint and complication in this patient. She went to scheduled rehabilitation faster to get the better performance after the surgery.

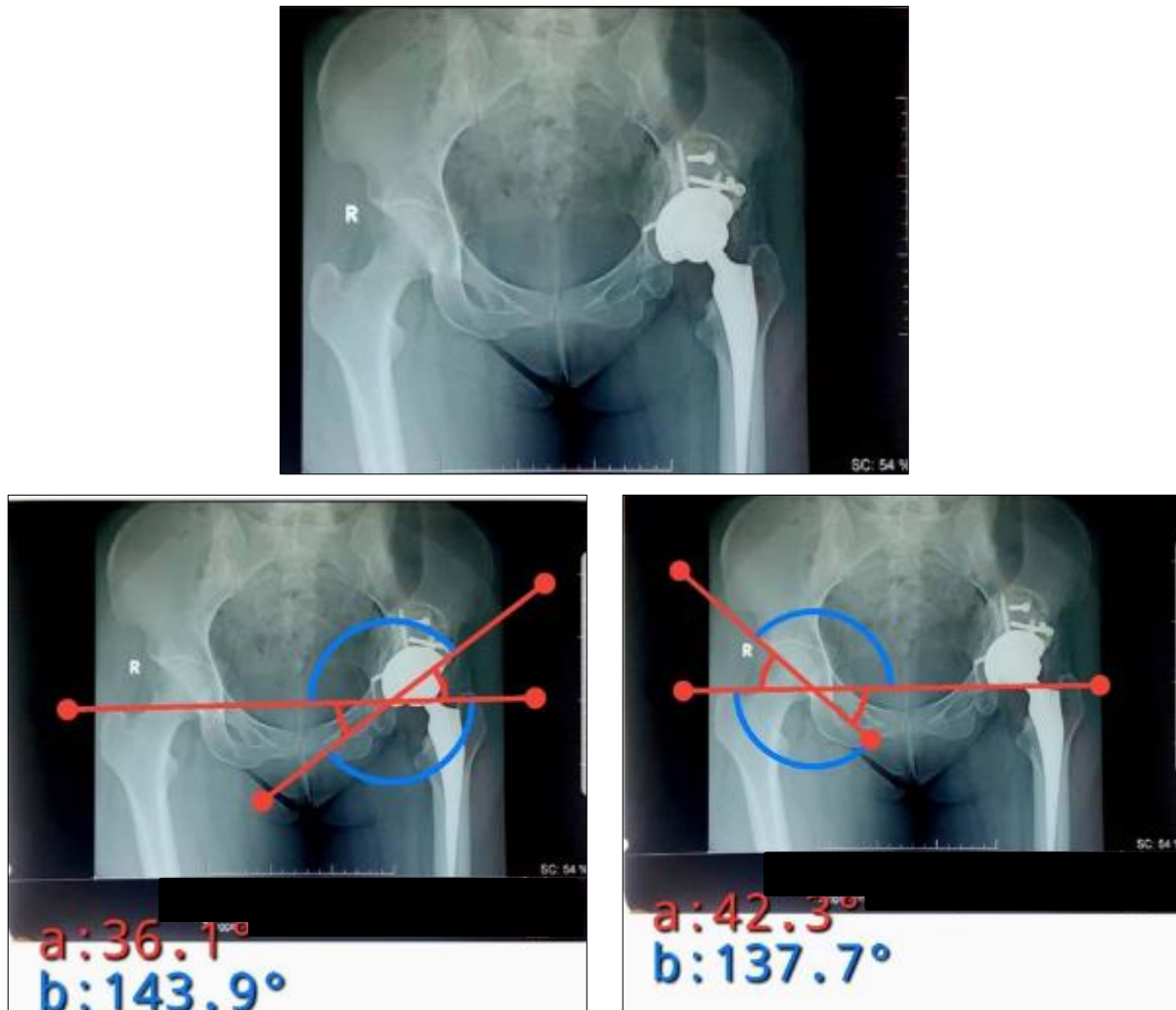


Figure 3 X-ray of the pelvic post THA (1 year after operation)

3. Discussion

The hip is a ball-and-socket joint that is inherently stable because of its bony geometry and strong ligaments, allowing it to resist significant increases in mechanical stress. Anatomic components contributing to the hip's stability include the depth of the acetabulum, the labrum, joint capsule, muscular support, and surrounding ligaments ⁴. The major

ligaments stabilizing the joint from directional forces include the iliofemoral ligament located anteriorly and the ischiofemoral ligament located posteriorly, and ligament teres is the ligament connecting the head of the femur to the acetabulum. Because the anterior ligaments are stronger, trauma to the hip commonly presents as a posterior dislocation when discovered (90% of cases) ⁵.

The majority of the blood supply to the head of the femur comes from the medial and lateral circumflex branches of the profunda femoris, which itself is a branch of the femoral artery. The medial and lateral circumflex femoral arteries anastomose to form a ring around the neck of the femur, from which many small arteries branch off to perfuse the femoral head. The femoral head articulates with the acetabulum, which is the “socket” of the hip. The acetabulum’s blood supply comes mainly from the acetabular branch of the obturator artery, along with contributions from pubic branches of the obturator artery, and deep branches of the superior gluteal artery.⁵ An understanding of the vasculature is important because trauma to the hip can displace the femoral head and interrupt the blood supply, leading to avascular necrosis (AVN) ⁵.

Hip dislocation is a medical emergency that needs to be treated within the first six hours to prevent the femoral head's possibilities of devascularization, which rise 20 times after the crucial period and result in avascular necrosis (AVN). There is a 6% incidence of AVN in hip dislocations that are reduced within 6 hours of damage, but this incidence sharply rises to 58% in hips that are reduced after a delay of more than 6 hours. Only a small number of authors have reported that open reduction and early traction were used to treat neglected hip dislocations in 100% of cases. The majority of the study focuses on children or teenagers since they have lesser likelihood of developing AVN than adults and need less energy trauma for dislocation to happen ¹. This patient barely can't walk, after 4 months motor vehicle accident. She felt her hip was became shorter without any pain. According to Kumar et al, Patient with neglected posterior dislocation on hip had leg length discrepancy within 2 cm in seven of the eight cases, and one patient had a discrepancy greater than 2 cm.

THA has now become so successful that it has been referred to as “the operation of the century”. It is the main surgical procedure in orthopaedics and it is a cost-effective treatment to recover pain-free mobility in patients suffering from degenerative bone and joint diseases such as osteoarthritis. The defective hip joint is replaced by an artificial acetabular cup and femoral head, which replace the damaged natural articulating surfaces. Therefore the materials must have low friction and withstand wear and oscillating mechanical load. The femoral head is anchored in the femur by the stem. The acetabular cup is anchored in the pelvis and is composed of a shell in which a liner is inserted that provides the load bearing articulating surface. This modular design allows using different materials with properties most suitable for their function. Shell and stem have to provide good bone integration and are frequently made of titanium and titanium alloy, respectively. Titanium alloys are however not hard enough for low-friction wear-resistant articulating surfaces. Therefore other materials are combined to meet the requirements for the articulating interface between head and cup. The frequently used notations metal-on-metal (MoM), ceramic-on-ceramic (CoC) or the classical combination metal-on-polyethylene (MoP) refer to the sequence of materials used for the femoral head and the acetabular cup (liner), respectively ⁴.

Bone graft is involved in almost every procedure that associated with reconstructive orthopaedic surgery ⁶. There are several types of bone graft, autograft, allograft, bone marrow aspirate and synthetic bone graft, in which all of this type of graft had its own characteristic. The autogenous bone graft known as the most advantageous type of the bone graft due to the osteoconductive and osteoinductive potential characteristic ⁷. Study involving 122 patient above 18 years old that undergo total hip arthroplasty with impaction bone graft shows that no difference in outcome of the hip function in first years and 5 years follow up to surgery ⁸. Also, several study revealed that cancellous morselized bone autograft (MBA) can be used to closed the defect that formed after previous condition or previous surgery and this defect should be closed to provide better stability and strength ⁹.

Cementless THA is rapidly being accepted as the surgery for arthritic diseases of the hip joint. The bone-ingrowth rate in porous-type cementless implants was about 90% over 10 years after surgery, showing that biological fixation of cementless THA was well maintained on both the stem and cup sides. Placing a cup in the physiological acetabular position with en bloc bone grafting is advantageous for most of the following points: leg length, range of motion (ROM), neck impingement, and applicable cup diameter ¹⁰. In this patient, the usage of cementless total hip arthroplasty augmented using bone graft was a recommended option after neglected fracture dislocation. After 1 year and 2 years post operation, the patient observed with full weight bearing without support and no significant complaint.

4. Conclusion

Hip dislocation is a medical emergency that needs to be treated within the first six hours to prevent the femoral head's possibilities of devascularization, which rise 20 times after the crucial period and result in avascular necrosis (AVN). THA has now become so successful that it has been referred to as “the operation of the century”. It is the main surgical procedure in orthopaedics and it is a cost-effective treatment to recover pain-free mobility in patients suffering from degenerative bone and joint diseases such as osteoarthritis. Total hip arthroplasty augmented with bone graft is a viable and recommended treatment option for neglected hip fractures or hip fractures in general.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

- [1] Jain M, Swaroop S, Kumar DS. Neglected Posterior Hip Dislocation in Adults presenting after One Year Managed Successfully with Single Stage Total Hip Arthroplasty: A Case Series. *J Orthop CASE REPORTS* [Internet]. 2021 Jun 10;11(6). Available from: <http://www.jocr.co.in/wp/2021/06/10/jocr-2021-v11-i06-2270-fulltext/>
- [2] Kumar S, Dahuja A, Narula MS, Garg S, Kaur R. Neglected hip dislocation: an unusual presentation, its management and review of the literature. *Strateg Trauma Limb Reconstr* [Internet]. 2017 Nov 30;12(3):189–92. Available from: <https://www.stlrjournal.com/doi/10.1007/s11751-017-0285-7>
- [3] Oommen AT, Krishnamoorthy VP, Poonnoose PM, Korula RJ. Fate of bone grafting for acetabular defects in total hip replacement. *Indian J Orthop* [Internet]. 2015 Apr 1; 49(2):181–6. Available from: <https://link.springer.com/10.4103/0019-5413.152462>
- [4] Singh A, Kumar P, Singh S, Singh RN, Telagareddy K. Primary Complex Total Hip Arthroplasty in Neglected Anterior Hip Dislocation With Comminuted Pertrochanteric Femur Fracture. *Arthroplast Today* [Internet]. 2021 Aug; 10: 63–7. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S2352344121000996>
- [5] Dawson-Amoah K, Raszewski J, Duplantier N, Waddell BS. Dislocation of the Hip: A Review of Types, Causes, and Treatment. *Ochsner J* [Internet]. 2018; 18(3):242–52. Available from: <http://www.ochsnerjournal.org/lookup/doi/10.31486/toj.17.0079>
- [6] Pape HC, Evans A, Kobbe P. Autologous Bone Graft: Properties and Techniques. *J Orthop Trauma* [Internet]. 2010 Mar; 24(Supplement 1):S36–40. Available from: <https://journals.lww.com/00005131-201003001-00008>
- [7] Aulakh TS, Jayasekera N, Kuiper JH, Richardson JB. Long-term clinical outcomes following the use of synthetic hydroxyapatite and bone graft in impaction in revision hip arthroplasty. *Biomaterials* [Internet]. 2009 Mar; 30(9):1732–8. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0142961208010119>
- [8] Costa ML, Achten J, Foguet P, Parsons NR. Comparison of hip function and quality of life of total hip arthroplasty and resurfacing arthroplasty in the treatment of young patients with arthritis of the hip joint at 5 years. *BMJ Open* [Internet]. 2018 Mar 12; 8(3):e018849. Available from: <https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2017-018849>
- [9] Bari YA, Chilmi MZ, Arianto HF, Soetojo BW. Morselized bone autograft for high placement of acetabular component closure with hip arthroplasty revision after 3-years screws and cup loosening: A case report. *Int J Surg Case Rep* [Internet]. 2022 Dec; 101:107789. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S2210261222010355>

- [10] Yamada H, Yoshihara Y, Henmi O, Morita M, Shiromoto Y, Kawano T, et al. Cementless total hip replacement: past, present, and future. *J Orthop Sci* [Internet]. 2009 Mar; 14(2):228–41. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0949265815321564>