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A Beneficial Bipolar Hemiarthroplasty on a Centenarian in One Developing Country

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ABSTRAK

Fraktur pinggul geriatri sering terjadi, namun operasi pada pasien berusia 100 tahun jarang terjadi di Indonesia. Kami melaporkan artroplasti pada wanita 100 tahun dengan fraktur panggul kanan dan fraktur Colles kanan yang menguntungkannya tiga tahun hidup aktif dan berkualitas. Meskipun usianya sangat lanjut, pasien cukup mandiri, aktif, dan mobilitasnya baik. Oleh karena itu perencanaan pra-operasi dan rehabilitasi paska-operasi yang cermat disusun oleh tim geriatri medis dan non-medis yang komprehensif. Hemiarthroplasty bipolar tanpa semen cukup sempurna untuk patah tulang pinggul di bawah anestesi regional sementara patah tulang Colles dikelola dengan reduksi tertutup dan plesteran. Rehabilitasi dimulai pada Hari ke-2 dan dilanjutkan beberapa minggu setelah pulang. Pasien dapat bertahan hidup dan sehat sampai setelah 3 tahun operasi. Pembedahan bermanfaat bagi pasien berusia 100 tahun; demi kepentingan terbaik mobilitas dan kualitas hidup pasien. Usia saja tidak boleh membatasi keputusan pembedahan selama semua komorbiditas dikendalikan oleh tim geriatri medis dan non-medis yang komprehensif.

Kata kunci: *cementless bipolar hemiarthroplasty, fraktur pinggul, usia lanjut, pembedahan.*

ABSTRACT

Geriatric hip fractures are common; however, surgery on a 100-year-old patient is rare in Indonesia. We report arthroplasty in 100-year-old woman with right hip fracture and right Colles fracture; which benefits her a three year of active and qualified life. Despite her age, the patient was quite independent, active, and mobile beforehand. Hence a meticulous preoperative planning and post-operative rehabilitation were structured by a comprehensive medic and non-medic geriatric team. Cementless bipolar hemiarthroplasty was perfectly sufficient for the hip fracture under regional anesthesia while the Colles fracture was managed with a close reduction and plastering. Rehabilitation was started on Day-2 and continued weeks after discharge. The patient is still alive and well 3 years after the surgery. Surgery is beneficial for the 100-year-old patient; it is in the best interests of the patient's mobility and quality of life. Age alone should not limit a surgical decision as long as all comorbidities are controlled by a comprehensive medic and non-medic geriatric team.

Keywords: *cementless bipolar hemiarthroplasty, hip fracture, elderly, surgery.*

INTRODUCTION

Indonesia is a developing Asian country where there are only few 100 years old patients with hip fracture undergoing a surgery. The uncommonness of the cases was shown by the lack of reported data. From the socio-cultural point of view, there's little to no reasons that medical decisions such as surgery should be performed on a very old patient. The number of hip fractures among the elderly is expected to surpass 6 million by the year 2050 worldwide.^{1,2} Geriatric hip fracture is highly burdening; not only is it a major morbidity, many of them never fully recover.³⁻⁵ Instead, hip fracture is one of the major problems in the very old patient due to bedridden worsening factors.^{4,5} By immaculate planning management, the sooner the surgery performed, the sooner patient back to usual active life, and skip the morbidity.^{5,6}

When a 100-year old woman, who was still healthy and active, tripped and needed a major surgery, several medical and non-medical preparations should be convened. Quality of life of the patient is one of the most important things to consider in planning a treatment management.^{5,6}

Our report discusses the benefit of surgery on a geriatric patient with a hip fracture contrary to the local socio-cultural beliefs that may prevent this medical procedure from being performed. This case report has been reported in line with the SCARE criteria.⁷

CASE ILLUSTRATION

A 100-year-old woman (Indonesian woman of Chinese descent), height 1.42 m, weight 39 kg, ASA II, and body mass index of 19.3 kg/m²) was admitted in ER after a domestic fall on September 2013. Patient was *compos mentis*; her heart rate was 80 bpm and blood pressure were 150/80 mmHg. Patient had a history of mild

hypertension and was on medication without hyperlipidemia, diabetes, nor cardiac arrhythmia. She was able to do daily activities independently before admission.

Patient felt pain on the right hip and wrist, both regions were swollen, deformed and had limitation of motion. The neurovascular and mental status were good. There were no other complaints associated with this injury.

X-ray of the hip lesion showed fracture of the trochanter of the right femur (AO classification 31-A1) and Colles fracture of the right wrist. Chest X-ray was normal, but ECG revealed minor mitral regurgitation.

Laboratory tests displayed within normal hematology value, insignificant liver and renal function, and all electrolytes were within normal value.

The thorough preparation involved a medic and paramedic incorporating team to convince the patient and the family about the benefits and the risks of the surgery and the necessary lengthy rehabilitation. Despite the commonly-perceived notoriety and the notion that doing surgery on a very old patient may potentially be useless and dangerous, the patient herself was willing to be mobile and able to enjoy her life again. The geriatric team prepared the informed consent form, explained and discussed the necessities and all possible risk factors of the treatment planning, the surgical procedure and anesthetic technique with the patient and the family.

Treatment planning, bipolar arthroplasty for right hip fracture, closed reduction and plastering for the right Colles fracture. Skin traction for the hip was applied one day before the surgery. The preoperative and postoperative X-ray(s) of the right wrist and hip are depicted in **Figure 1** and **2**, respectively.



Figure 1. Colles fracture. (a) Right colles fracture before reduction (b) After reduction in circular cast.

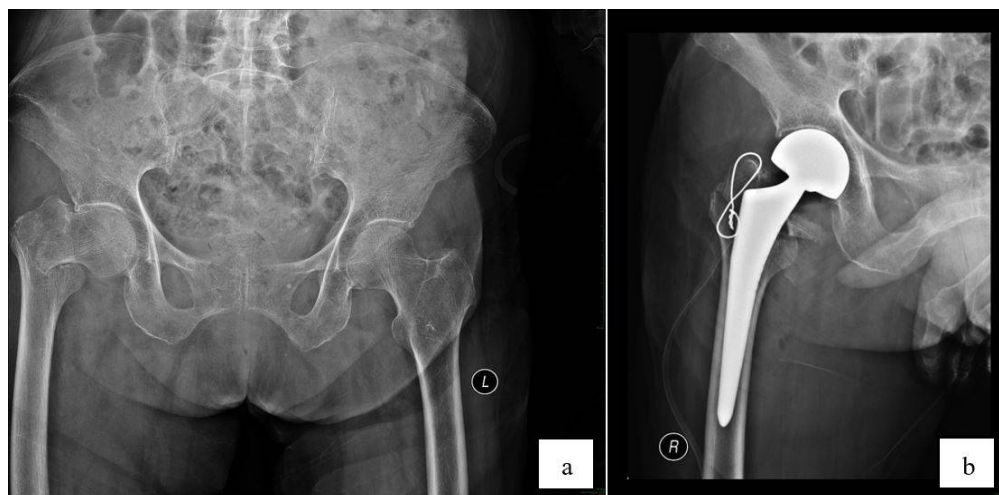


Figure 2. Hip Fracture. (a) X-ray of right fracture pertrochanter hip. (b) X-ray after bipolar arthroplasty and sanar wire augmentation.

Preoperative medication, the existent antihypertensive medication (amlodipine 5 mg p.o. o.d), celecoxib 40 mg i.v. o.d for analgesic and ceftriaxone 2 mg i.v. o.d. as prophylactic antibiotics.

Surgery was performed under regional anesthesia (epidural anesthesia) using Marcaine 0.5%. Cementless bipolar hemiarthroplasty was inserted by the Moore's posterior approach in lateral decubitus position. The trochanter mayor was fixated using wire.

There was no prosthesis instability nor leg length discrepancy, which were checked while in the OR immediately after the surgery.

The surgery took 120 minutes with 400 ml blood loss and a drain was inserted for 2 days evaluation. Hemoglobin post-surgery was 9.5 gr%; transfusion was not needed. From the recovery room, patient was admitted in ICU for overnight observation.

Post-operative medication, the prophylactic antibiotic ceftriaxone 1 g i.v. t.i.d. for 2 days. Analgesic was changed to Tramadol 50 mg i.v. b.i.d. Other medications were amlodipine 5 mg p.o. o.d., citicoline 500 mg p.o. t.i.d., omeprazole 20 mg i.v. b.i.d. for two days, and alprazolam 1 mg p.o. o.d. prn.

On the second day (Day 1 post-surgery), patient was transferred to the ward. Some insignificant predictable complications occurred, such as constipation, sleeping difficulties, and delirium due to dementia drugs. Gradual

mobilization was started by the physiotherapy team. Patient was put on half sitting position while leaning on the head of the bed with limited range of motion (ROM) of the hip joint. The rehabilitation program for active and passive movement was held twice a day. Post-operative blood from drain was 180 ml, became minimal to less than 30 ml, and the drain was off by 2x24 hours post-surgery. Hemoglobin on Day 2 post-surgery was 10.5 gr%.

On the fourth day of post-surgery, the patient was encouraged to sit and increase her hip joint ROM. On the fifth day, the patient was trained to sit on the bedside and transferred to a chair or wheelchair. The rehabilitation process was done gradually by Log-rolling, sitting-standing, and partial weight bearing walking using U walker. The clinical photo of patient's rehabilitation process is depicted in **Figure 3**.

On the sixth day, the patient was discharged as scheduled owing to the good and significant recovery as well as the mobility progression. The distal perfusion and ROM evaluation of the Colles fracture were good with minimal VAS score (1-2). The plastering of the Colles fracture was kept for 5 days and then was changed into skin tight before discharge. All surgical-related medications were discontinued upon discharge. The patient's care-giver was her youngest daughter who stayed with her. The care-giver was taught to clean the wound areas and keep the rehabilitation program twice a day.



Figure 3. (a) (b) Sequences of rehabilitation 2nd after surgery, (c) 3rd day after operation, (d) 4 years after surgery.

Follow-ups were scheduled on the 2nd week for wound care and physiotherapy evaluation. Surgical wound was healed without any sign of skin inflammation. The VAS for hip and wrist was minimal (1-2). Physiotherapy was continued as scheduled.

Four weeks post-surgery, the hip joint was functioning well; good ROM without pain. The wrist was clinically union, well-functioning and the patient could hold the walker without pain; but the wrist x-ray showed minimal calluses and revealed shortening of the radial bone. The wrist cast was removed, and the patient felt fine. A rehabilitation physiotherapy program was continued to improve the range of motion of the wrist and the patient was also asked to continue mobilization with walker at home until 6-8 weeks.

A recent interview (2nd March 2017) with the patients' family revealed that the patient was still mobile and active until two years post-surgery (2015) without any complications. However, in the last years (2016-2017), her dementia and cataract worsened, which affected her activity; yet, she was otherwise in good health regarding her hip-related condition.

DISCUSSION

Hip fractures are very common among elderly patients due to osteoporosis and multiple associated diseases.⁶ This type of fracture increases the risk of morbidity and mortality among the elderly.^{2,3} Elderly people are frail, disabled and dependent.⁸⁻¹⁰ Among the elderly, severe disability after acute hospitalization is most commonly caused by falls and hip fracture.^{10,11}

In this case there are some comorbidities that were managed by the geriatric medical team.

The meticulous pre-operative planning and post-operative rehabilitation as one medical decision were structured to minimize post-operative complications.^{5,6,8} Regardless of the age, the patient was quite independent, active and mobile before the fracture; hence a comprehensive management incorporating the veracious surgical and anesthesia technique, the exact implant selecting, and immediate post-operative rehabilitation was taken into consideration.

People aged 90 years old or older are prone to suffer traumatic injuries that would cause hip fractures requiring care and rehabilitation. Furthermore, this age is associated with increased mortality and worse chance of functional recovery.¹² Even though the risks of complication are high, a study by Domenico et al. showed that patients 90 years of age or older with hip fracture achieved a surprisingly good post-operative outcome and returned home after rehabilitation.¹³ In this case, the patient had a positive outcome due to a multidisciplinary approach and comprehensive care of the patient before, during, and after the surgery. In the absence of routine follow-up, complications after a hip hemiarthroplasty are frequently present; most of them require surgical reintervention.¹⁴

Cementless bipolar hemiarthroplasty was performed through Moore's posterior approach. Cementless type of prosthesis was chosen to decrease blood loss during operation. It also has a lower dislocation rate; therefore, the rehabilitation process could be done swiftly without limitations and with a lower risk of pulmonary embolism due to prosthetics.⁸ The Austin-Moore Hemiarthroplasty has been used for more than 60 years and is frequently performed for dependent elderly patients.¹⁵

The result of the study conducted by Lin et al.¹⁴ suggested that elderly patients who receive bipolar hemiarthroplasty may have a better rate of survival compared to those who receive unipolar hemiarthroplasty.¹⁵ Some studies suggest that cemented prosthesis could reduce postoperative thigh pain, aseptic loosening, and the incidence of periprosthetic fracture.^{16,17} However, uncemented prostheses are believed by some surgeons to be able to eliminate cement-related complications and mortality and; shorten surgery time, thus reducing complications that may arise after the surgery.^{18,19} The Colles fracture was managed by a closed reduction and plastering to decrease the surgery time. Plastering would be changed into skin tight cast one week later, which then would be continued for four weeks, when there's a sign of clinical healing. Unstable distal radius fractures (Colles fracture) can be treated with closed reduction and cast application in low-demand elderly patients to avoid risks and complications of surgery.²⁰ Although there was malunion (4 weeks post-operative in X-ray perspective), but the wrist itself is in good function and painless when the patient held her walker.

The geriatric medic and non-medic team are very important; they are required to assess medical problems, to minimize risk of complications that may arise before, during, and after the surgery. The geriatric team was also involved since the first time in delivering informed consent and in discussing the non-medical issues as well. Based on the research results provided by Domenico et.al., a comprehensive geriatric assessment combined with a good multidisciplinary approach could provide a positive outcome for the elderly.¹³ The short-term outcome of surgical management for Asian nonagenarian with hip fractures is favorable in selected patients.²¹ The positive post-operative condition of the patient was also due to the comprehensive rehabilitation management during recovery, and the utmost supports from the family to keep the patient mobile and active, irrespective of her age.

This case is reported to inspire medical professionals in Asian developing countries that performing surgery on an elderly patient is possible, or even mandatory as long as the case

is devoid of absolute contraindications. A good and comprehensive geriatric team is a must.

CONCLUSION

Performing a Bipolar Hemiarthroplasty in a previously healthy, active, and mobile 100-year-old patient with hip fracture is a highly recommended medical decision. Age alone should not limit a surgical decision as long as all comorbidities are controlled, and complications are prevented by a comprehensive medic and non-medic geriatric team.

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