

Femoral Head Reduction Osteotomy for Deformed Perthes Head Using Ganz Safe Surgical Dislocation of Hip – A Case Report with 3-Year Follow-up

Praveen Govardhan¹, R H Govardhan¹

Learning Point of the Article:

Femoral head reduction osteotomy using Ganz safe surgical dislocation of the hip is a safe and effective joint preservation surgery to treat deformed femoral head in adolescent and young adults.

Abstract

Introduction: Perthes disease often results in a non-spherical deformed femoral head which causes pain, dysfunction, early degeneration, and arthritis in young adults. The importance of preservation of native hip in young adults has been well proven. We report a case of deformed Perthes head treated with femoral head reduction osteotomy using Ganz safe surgical dislocation which is a technically demanding but highly rewarding surgical procedure.

Case Report: A 18-year-old female suffering with hip pain and limp for the past 2 years was diagnosed as sequelae of Perthes disease with femoral head deformity. Pre-operative Harris hip score was 54. The patient was planned for joint preservation surgery considering the young age. Ganz safe surgical dislocation was used to expose the hip joint and femoral head reduction osteotomy was done to recreate the sphericity of the femoral head. After 3-year follow-up, the patient had significant pain relief and restoration of function with no evidence of avascular of the femoral head. Post-operative Harris hip score was 82. The treatment of deformed Perthes femoral head remains controversial with no gold standard treatment. Femoral head reduction osteotomy allows the surgeon to reduce the size of the femoral head and restore sphericity of the femoral head preserving the blood supply and helps to improve the functional outcome of the patient. Our case report with 3-year follow-up is evidence to prove the same.

Conclusion: Femoral head reduction osteotomy using Ganz safe surgical dislocation is a safe and effective joint preservation surgery to treat deformed Perthes femoral head in adolescent and young adults.

Keywords: Femoral head deformity, osteotomy, Legg-Calve-Perthes disease.

Introduction

Sequelae of Perthes disease commonly manifests as deformed aspherical large femoral heads which contribute to pain, dysfunction, and early degenerative arthritis in young adults [1]. The importance of preservation of native hip in young adults has been well proven [2]. There have been very few reports of femoral head reduction osteotomy surgical procedure, the reason being the fear of avascular necrosis [3]. This report describes our experience in a private practice setting with correction of the proximal femoral deformity associated with Perthes disease by femoral head reduction osteotomy

using Ganz safe surgical dislocation [4] which is a technically demanding but highly rewarding surgical procedure.

Case Report

A 18-year-old thin built (body mass index-21) young Indian lady who is a college student presented to us with complaints of the left groin pain which was insidious in onset and progressive in nature associated with limp for the past 2 years. She had no history of trauma or signs of infection. Laboratory data revealed that her white blood counts, erythrocyte sedimentation rate, and C-reactive protein were within normal limits. Her clinical

Access this article online

Website:
www.jocr.co.in

DOI:
10.13107/jocr.2020.v10.i06.1864

Author's Photo Gallery



Dr. Praveen Govardhan



Dr. R H Govardhan

¹Department of Orthopedics and Arthroplasty, Vasanthi Orthopedic Hospital, Chennai, Tamil Nadu, India.

Address of Correspondence:

Dr. Praveen Govardhan,
Department of Orthopedics and Arthroplasty, Vasanthi Orthopedic Hospital, Chennai, Tamil Nadu, India.
E-mail: rgpraveen2005@yahoo.com



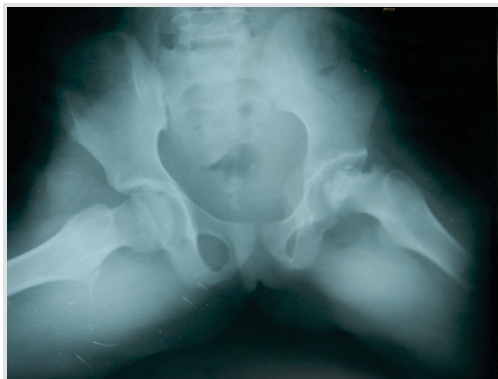


Figure 1: Pre-operative X-ray showing deformed left Perthes head.



Figure 2: Showing intraoperative picture of deformed femoral head after safe surgical hip dislocation.

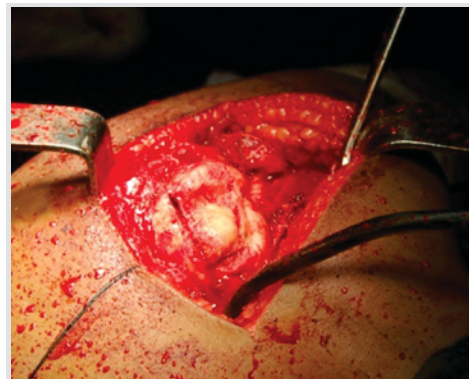


Figure 3: Showing central necrotic portion being osteotomized.

findings included restricted hip abduction and terminally restricted hip flexion associated with pain. Radiological findings included deformed Perthes like femoral head (Fig. 1). Considering her age and history, clinical, and radiological findings, [5] we diagnosed her as sequelae of Perthes disease with deformed femoral head. Her pre-operative Harris hip score was 54. Hip range of movements was restricted with significant pain. Considering the young age of the patient, joint replacement surgery was ruled out, and we planned for joint preservation surgery [6]. There are many described methods of joint preservation surgery for tackling deformed Perthes head, but till date, there is no gold standard treatment [7]. Treatment alternatives were discussed with patient as part of the informed consent process, including valgus intertrochanteric osteotomy [8], hip fusion [9], and pelvic supportive osteotomy [7]. Reviewing the literature and with patient approval, femoral head reduction osteotomy [10] was planned. The senior orthopedic surgeon performed the surgery using Ganz surgical hip dislocation [11] with trochanteric flip surgical approach which gave an extensile 360° view of the deformed femoral head (Fig. 2). The central necrotic collapsed portion was identified, osteotomized (Fig. 3), and excised (Fig. 4). The mobile head fragment was repositioned to create a spherical smaller femoral head (Fig. 5) and was fixed with two 3.5 mm cortical screws at the neck level, and two more 6.5 mm cancellous screws were used to fix the trochanter. Post-operative protocol included non-weight bear mobilization for 6 weeks followed by toe touch mobilization with a crutch for 6 more weeks followed by

weight-bearing as tolerated. The patient was able to walk without any aids (Fig. 6) by 3 months with Harris hip score of 82. The patient is now able to do active straight leg raises against resistance (Fig. 7), walks independently pain-free with good range of movements, including hip flexion of more than 90° (Fig. 8) after 3-year follow-up with no radiological signs of avascular necrosis of femoral head (Fig. 9).

Discussion

Perthes disease is a self-limiting idiopathic avascular necrosis of capital femoral epiphysis in a child [12], but sometimes results in deformed Perthes head causing pain and early arthritis.. Treatment of deformed Perthes femoral head remains controversial with no gold standard treatment. The prime aim of the treatment is to maintain the sphericity of the femoral head and to prevent secondary degenerative arthritis [13]. Early diagnosis and management can help to prevent the collapse of the femoral head, progressive femoral head deformity, and impingement. The aspherical coxa magna femoral head can be made more spherical by intra-articular osteotomy [4, 13]. Theoretically, if femoral head sphericity can be restored, then the femoral head should last much longer. The Ganz technique femoral head reduction osteotomy helps to reduce the size and restore the spherical shape of the femoral head. The surgical procedure includes Ganz safe surgical hip dislocation which is one of the unique approach of dislocating the femur preserving the vascularity of the head providing an extensile view of a hip joint compared to any other approach [14]. The meticulous

attention to detail and soft-tissue handling plays a major role in the success of the procedure. Very few reports of this surgery have been found in the literature. Our experience with this procedure has shown promising results after 3-year follow-up with a significant improvement in Harris hip score and functional range of movements.

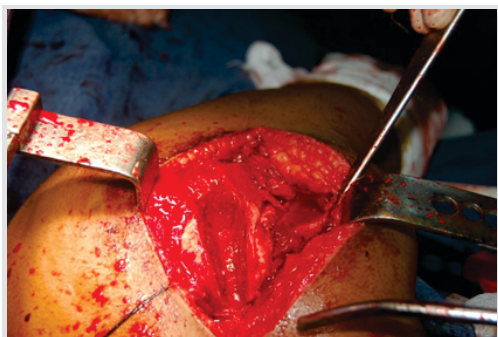


Figure 4: Femoral head after excision of central deformed portion.

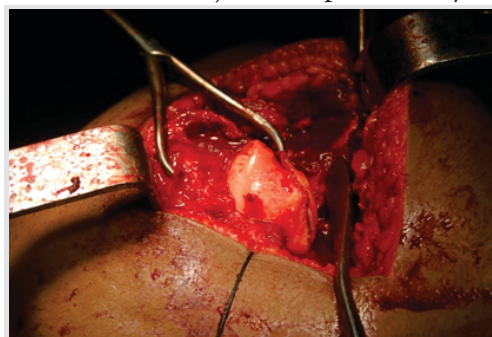


Figure 5: Realigned femoral head after osteotomy.



Figure 6: Showing patient weight-bearing independently with no support.



Figure 7: Showing full active hip abduction against resistance.



Figure 8: Showing range of movement.

The only limitation is the number of cases included in the study. Risk of avascular necrosis is significant but can be avoided if the osteotomy is performed correctly with meticulous attention in the preservation of blood supply to the femoral head. The risk of avascular necrosis in a symptomatic patient may be acceptable because there is always an option for future total hip replacement surgery.

Conclusion

Femoral head reduction osteotomy using Ganz safe surgical dislocation is a safe and effective joint preservation surgery to treat deformed Perthes femoral head in adolescent and young adults. Long-term follow-up will determine whether the excellent results will hold up and whether the progress of the disease will be altered by this osteotomy procedure. Further

plementation of this surgery by other surgeons and reporting their results would pave the way to femoral head reduction osteotomy of being the gold standard treatment for deformed Perthes head.



Figure 9: Three-year follow-up X-ray with no evidence of AVN.

Clinical Message

Femoral head reduction osteotomy using Ganz safe surgical dislocation of the hip is a safe and effective joint preservation surgery to treat deformed femoral head in adolescent and young adults.

References

1. Anderson LA, Erickson JA, Severson EP, Peters CL. Sequelae of perthes disease: Treatment with surgical hip dislocation and relative femoral neck lengthening. *J Pediatr Orthop* 2010;30:758-66.
2. Adler KL, Cook PC, Geisler PR, Yen YM, Giordano BD. Current concepts in hip preservation surgery: Part II--rehabilitation. *Sports Health* 2016;8:57-64.
3. Siebenrock KA, Anwender H, Zurmühle CA, Tannast M, Slongo T, Steppacher SD. Head reduction osteotomy with additional containment surgery improves sphericity and containment and reduces pain in Legg-Calvé-Perthes disease. *Clin Orthop Relat Res* 2015;473:1274-83.
4. Paley D. The treatment of femoral head deformity and coxa magna by the Ganz femoral head reduction osteotomy. *Orthop Clin North Am* 2011;42:389.
5. Nelitz M, Lippacher S, Krauspe R, Reichel H. Perthes disease: Current principles of diagnosis and treatment. *Dtsch Arztebl Int* 2009;106:517-23.
6. Albers CE, Steppacher SD, Ganz R, Siebenrock KA, Tannast M. Joint-preserving surgery improves pain, range of motion, and abductor strength after Legg-Calvé-Perthes disease. *Clin Orthop Relat Res* 2012;470:2450-61.
7. Joseph B. Management of Perthes' disease. *Indian J Orthop* 2015;49:10-6.
8. Pécasse GA, Eijer H, Haverkamp D, Marti RK. Intertrochanteric osteotomy in young adults for sequelae of Legg-Calvé-Perthes' disease--a long term follow-up. *Int Orthop* 2004;28:44-7.
9. Bittersohl B, Zaps D, Bomar JD, Hosalkar HS. Hip arthrodesis in the pediatric population: Where do we stand? *Orthop Rev (Pavia)* 2011;3:e13.
10. Dror P, David F. Femoral head reduction osteotomy: A case-based approach. In: *Pediatric Pelvic and Proximal Femoral Osteotomies*. Berlin, Germany: Springer; 2018.
11. Ganz R, Gill TJ, Gautier E, Ganz K, Krügel N, Berlemann U. Surgical dislocation of the adult hip. *J Bone Joint Surg Br*

- 2001;8:1119-24.
12. Divi SN, Bielski RJ. Legg-Calvé-Perthes disease. *Pediatr Ann* 2016;45:e144-9.
13. Burian M, Dunl P, Nanka O, Chomiak J, Ostadal M, Monika F, et al. Anteromedial wedge reduction osteotomy for the treatment of femoral head deformities. *Hip Int* 2013;23:281-6.
14. Lazaro LE, Sculco PK, Pardee NC, Klinger CE, Dyke JP, Helfet DL, et al. Assessment of femoral head and head-neck junction perfusion following surgical hip dislocation using gadolinium-enhanced magnetic resonance imaging: A cadaveric study. *J Bone Joint Surg Am* 2013;95:e1821-8.

Conflict of Interest: Nil
Source of Support: Nil

Consent: The authors confirm that Informed consent of the patient is taken for publication of this case report

How to Cite this Article

Govardhan P, Govardhan RH. Femoral Head Reduction Osteotomy for Deformed Perthes Head Using Ganz Safe Surgical Dislocation of Hip – A Case Report with 3-Year Follow-up. *Journal of Orthopaedic Case Reports* 2020 September;10(6): 32-35.