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DISLOCATION OUTCOMES IN 'T', 'L', 'H' SHAPED POSTERIOR CAPSULOTOMIES ON DISLOCATION IN HIP HEMIARTHROPLASTY

Orthopaedics

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KEYWORDS

INTRODUCTION

Nowadays hemiarthroplasty is the commonly done procedure for displaced femoral neck fractures in old age [1,2] and they are also accompanied by complications like dislocation of the prosthesis, peri-prosthetic fractures and infection which are causes for resurgery , morbidity and mortality. However prosthesis dislocation is the leading cause of resurgery.[3-7]

Posterior Southern Moore and lateral Hardinge approaches are the most preferred approaches during hemiarthroplasty. Many studies are there to provide information about impact of approaches on prosthetic dislocation. Anyways, there is no study to prove about the best approach.Despite studies been there to prove posterior approach results in higher dislocation rates than lateral approach[4,8-14] however modidications in posterior approach through proper soft tissue repair or posterior repair prevented significant dislocation rates [15,16,17].

In our study, we evaluated the efficacy of 'T' ,'L','H' shaped capulotomy techniques on dislocation, during hemiarthroplasty performed only through posterior Southern-Moore approach. We hypothesised integrity of the capsule will be preserved in 'L' shaped incision of the capsule and prevents dislocation of prosthesis

MATERIALS AND METHODS

After the clearance from ethics commitee, this study was conducted in our college 210 patients aged above 65 ,were included in this prospective study between June 2017 to May 2019 . Patients with neck of femur fractures ,who had nil contradiction to anesthesia and were planned for cemented bipolar hemiarthroplasty.Three groups were assigned group1 was capsulotomy in 'T' shape, group 2 was 'L' shape, group 3 was 'H'shaped

INCLUSION CRITERIA:

1. displaced neck of femur above the age of 65 was selected

EXCLUSION CRITERIA:

1. patients with other hip fractures other than neck of femur[n=12]
2. pathological fractures [n=1]
3. hip dysplasia with CE angle of Wieberg lower than 25°[18][n=0]
4. rheumatoid arthritis [n=1]
5. leg length discrepancy over 1cm[18] when compared to opposite hip [n=1]
6. difference in offset more than 10% [9] [n=0]
7. patients who could not be mobilised in walker or partial weight bearing could not be done in 5 days post operatively[n=19]
8. patient with cognitive disorders like parkinsonism ,who has uncontrolled tremors were excluded [n=1]

1 patient died of bone cement implantation syndrome, 6 patients didn't come for follow up . Of a total 42 patients was excluded. In the statistical analyses ,dislocation rate was analysed iin168 patients . hemiarthroplasty was performed with T, L, H shaped capsulotomy. The mean age of patient with 'T' capsulotomy was 74.5, 'L' capsulotomy was 74.1 and 'H'capsulotomy 74.2 and the diference between patient age groups was compared through chi-squared chart [$p < 0.05$]

Informed written consent was obtained from all the patients . Under spinal anaesthesia patient in lateral position, through Southern Moore posterolateral approach, gluteus maximus fibres were split,the short external rotators was sling sutured after identifying the sciatic nerve.

The hip joint capsule was fully exposed at the posterior, superior and inferior. From the labrum incision was started, continued through the long axis of the neck of femur, and ending at the intertrochanteric line, and respective 'T', 'L', 'H' incision was then performed. The capsule flaps was hooked with sling sutures, the intraarticular hip was fully exposed [Figure 1,2,3]. Cemented collarless bipolar hip prosthesis was placed in the femoral canal in all patients. Capsule repair was done by no1 vicryl, a maximum three sutures were placed. The short external rotators were sutured and posterior repair was done.

Patients were given lmw heparin thromboprophylaxis, drain was removed after 48 hours,and then the patient was mobilised with walker support under supervision. Abduction pillow was placed when the patient rests or sleep for 3 weeks, patient was called for follow up on 3,6,12,24 weeks and thereafter 6 monthly.

RESULTS

Although there is no significant difference in dislocation between T vs L ,but H Capsulotomies showed significant ,atraumatic dislocation rates. all dislocations occurred within 1 month after operation, of which all the dislocation were first attempted with closed reduction of which two were successful . There were no atraumatic dislocation in rest 84 patients following 1 year follow-up.

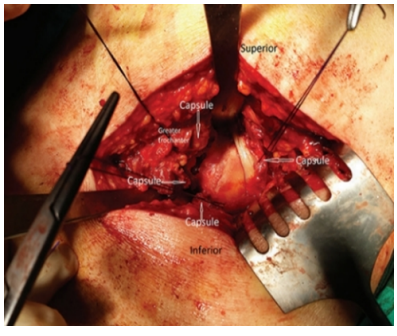

Figure 1: visualisation of the hip capsule after L shaped capsulotomy

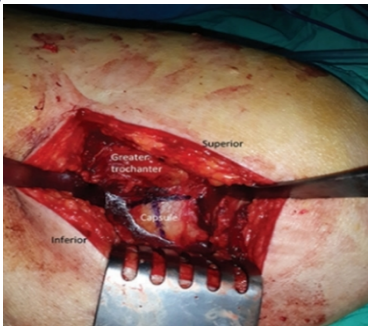

Figure 2: T shaped incision over capsule after incision from long axis of the femoral neck and incision parallel to intertrochanteric line

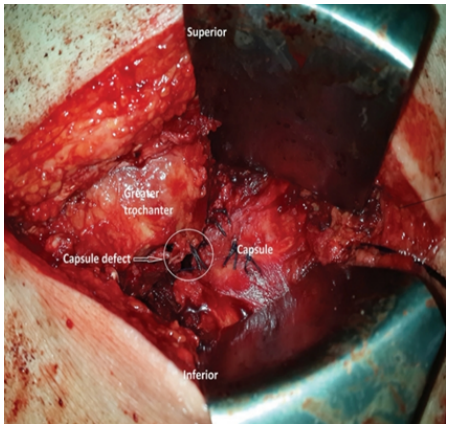

Figure 3: capsule coverage after T shaped incision

Table1: results showing atraumatic dislocation following each capsulotomy procedures

	't' Capsulotomy [n=60]	'l' Capsulotomy [n=57]	'h' Capsulotomy [n=49]	P value= 0.7870
Atraumatic Dislocations	2	1	2	5
Not dislocated	58	56	49	163
	3.44%	1.78%	4.08%	

Chi - square test is 0.479, the p value is 0.7870. The result is no significant as the p value is less than 0.05

DISCUSSION

Main complications of hip hemi arthroplasty are implant loosening, prosthesis dislocation, periprosthetic fracture [20]Prosthetic dislocation mostly develops within 6–8 weeks after surgery when the surrounding capsule and soft tissues heals during this time[3,8-10,21]by various authors it has been said there is no difference dislocation rated when compared to cemented vs uncemented [22,23,24]. Advantage of cemented prosthesis is that it allows arlier mobilisation when compared to uncemented prosthesis [25,26]. Smaller Wieberg CE angle and decreased femoral offset compared to opposite leg increased the dislocation rate.

Postoperative radiograph offset difference more 10% increased the risk of dislocation [9] leg length descrepency of less than 1cm provided better functional results [19]

Patients with cognitive dysfunction had lesser dislocation rateon anterior approach compared to posterior approach [28]. Although anterior approach was safer for dislocation than the posterior approach [8,10] ,posterior dislocation mainly occurred with inadequate soft tissue coverage [32] Williams *et al*.[15] performed hemiarthroplasty by peripheral incision of the capsule at the fracture line distally,thus preserving piriformis and labrum to achieve stable posterior approach

Ko *et al*.[17] reported that the defect in the capsule caused herniation of the prosthesis, then he did locking loop stitches of the tranverse legs of 'T' to the greater trochanter ,with short external rotator repair found no dislocations occurred.

In our study after eliminating the exclusion criteria like offset difference more than 10%, Wieberg CE angle lower than 25% and leg length descrepency more than 1cm,we refined assessment to between 'T', 'L', 'H' Capsulotomy methods on dislocation. In our study, we found adequate exposure and delivery of the head was better in H>L>T, Capsular defect after suturing was more pronounced in T>H>L. None of patient required conversion of one technique to another. According to Ko *et al* [17], transverse legs of T ,which in turn provided poor healing capacity of the capsule. 1.7% of the patient who underwent 'L' shaped incision of the capsule developed dislocation. Patient who under 'T' capsulotomy 3.44% got dislocated and 'H' capsulotomy 4.08% got dislocated Our limitation of study was assessing techniques on mental dysfunction patients,an offset difference of 10% or more compared to opposite side, difference in anteversion in different patient might have contributed to dislocation

CONCLUSION

'L'shaped capsulotomy is the most efficient in preventing posterior dislocation in posterolateral approach while performing Hip arthroplasty when performed with proper posterior repair.

THERE IS NO CONFLICT OF INTEREST

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