

SHELF OSTEOTOMY AND TROCHANTERIC EPIPHYSIODESIS IN ADVANCED STAGE OF PERTHE'S DISEASE



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SVNIR TAR

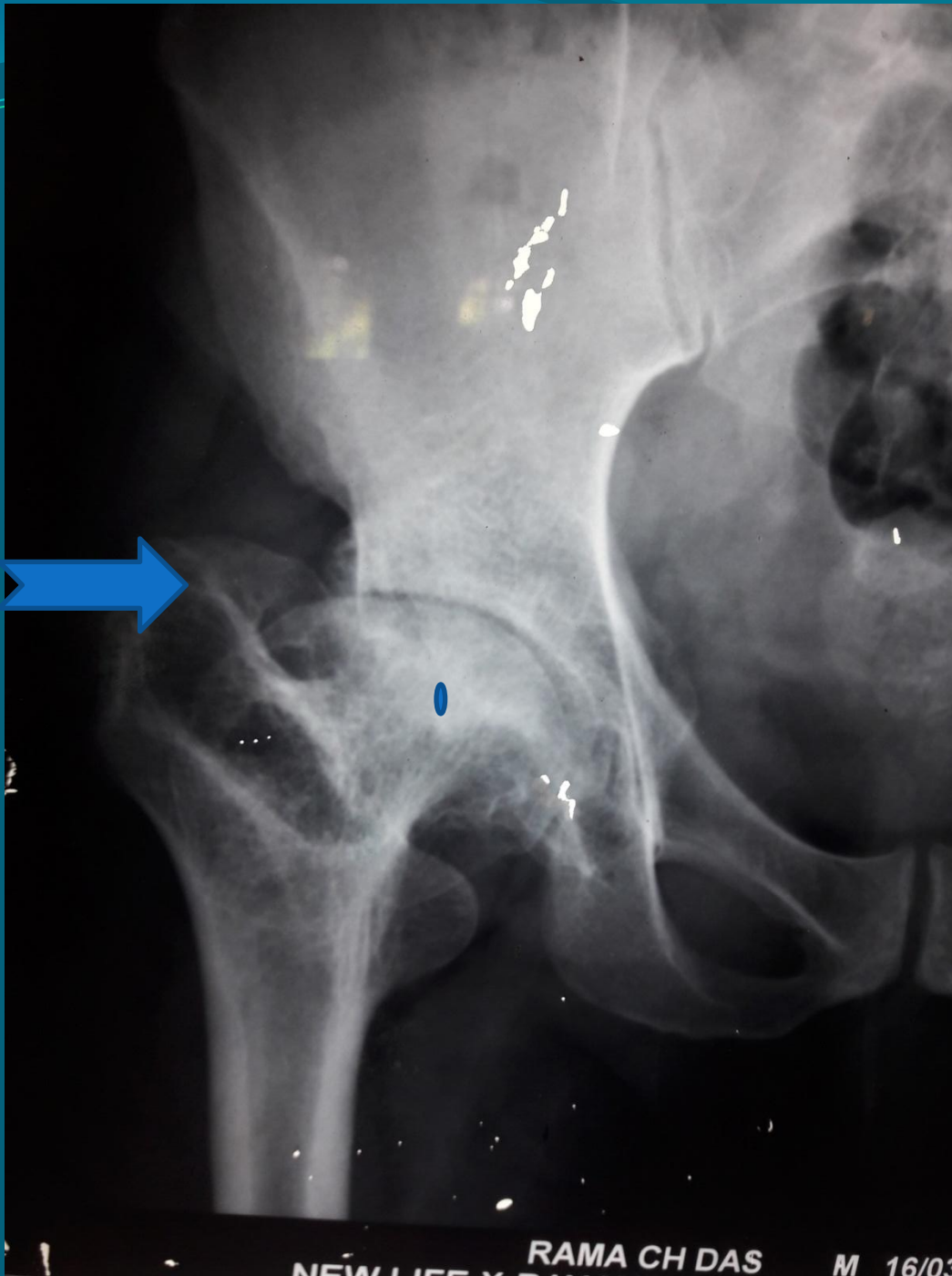
प्रनवांग सेवा भवन
REHABILITATION SERVICES BUILDING



- **Legg-Calvé-Perthes disease** is avascular necrosis of the proximal femoral epiphysis of unknown aetiology and Surgery aimed at achieving or maintaining contention and offers the advantage of early mobilization and avoids lengthy immobilization.
- **Content surgery** can be achieved by addressing either femoral or acetabulum or both.

Associated problems in older LCP

- **Relative overgrowth of the greater trochanter.**
- **Physeal arrest results in a short femoral neck**
- **High-riding greater trochanter decreases the tension of hip abductors, resulting in pelvic instability (Trendelenburg sign) and limping.**
- **Limitation of abduction is caused by trochanteric impingement too.**



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NEW LIFE X RAYS

Why to treat Perthes'?

- . Deformation and Enlargement of femoral head
- . Trochanteric overgrowth
- . Secondary degenerative arthritis of hip

Facts

The choice of surgery depends on

- surgeon's preference,
- shape and concentricity of the femoral head,
- and congruency of the hip joint.

Facts

- **Surgical treatments have demonstrated their efficacy in re centering the femoral head within acetabulum nevertheless with complications.**
- **Indian population needs a special mentioning – cross leg and squatting posture**
- **No previous study has looked prospectively in to the effect of surgery on severe LCP and documented the outcomes.**

COMPLICATIONS OF VDRO

- COXA VARA
- SHORTENING
- TROCHANTERIC OVERGROWTH
- TRENDELENBERG GAIT
- R/O IMPLANTS



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LUCKY X-RAY SALEPUR

COMPLICATIONS OF SALTER'S/CHIARI

- **TECHNICALLY DEMANDING**
- **INTRAOPERATIVE NERVE AND VESSEL INJURY**
- **GRAFT OR PIN DISPLACEMENT**
- **DEEP INFECTION**
- **HIP JOINT STIFFNESS**

Therefore

- **No consensus has been arrived regarding the indications of surgical procedure.**
- **Common sense directs to chose a procedure that minimizes the risk of complications and side effects.**
- **Augmentation shelf acetabuloplasty and trochanteric epiphysiodesis is a promising procedure .**

Inclusion criteria

- **Epiphysial involvement- (Catterall's) III, IV, Salter-Thompson B, Herring B,C.**
- **Age group- More than 8**
- **Stage of Evolution- IIb,IIIa (late fragmentation and early regeneration)**
- **Epiphysial extrusion- More than 20%**
- **Decrease ROM of Hip**
- **No previous surgery**

Materials

- Cases reported between 2002-2012
- 198 patients identified with LCP
- 39 hips were identified fulfilling our criteria (32 children; 22 boys and 10 girls; (25-UNI- 7 B/L)
- Average age at the time of reporting 11.4 years.
- Left- 25, Right-14Hips
- Mean age at surgery 11.1
- Mean Follow up was 5 years
- All cases had Traction, Bed rest, Physiotherapy prior to surgery
- 3 hips were lost during follow-up

Shelf Acetabuloplasty

- Shelf acetabuloplasty stabilize the acetabular labrum and have a stimulatory effect on acetabular growth .

Operating procedure:

- Identify superior acetabular edge
- Create slot 1cm deep along edge
- Remove 1 cm cortical strips from outer table
- Insert into slot, cutting at desired lateral overhang and 2nd layer inserted lengthwise and remaining to fill in above slot edge
- Held in place with rectus

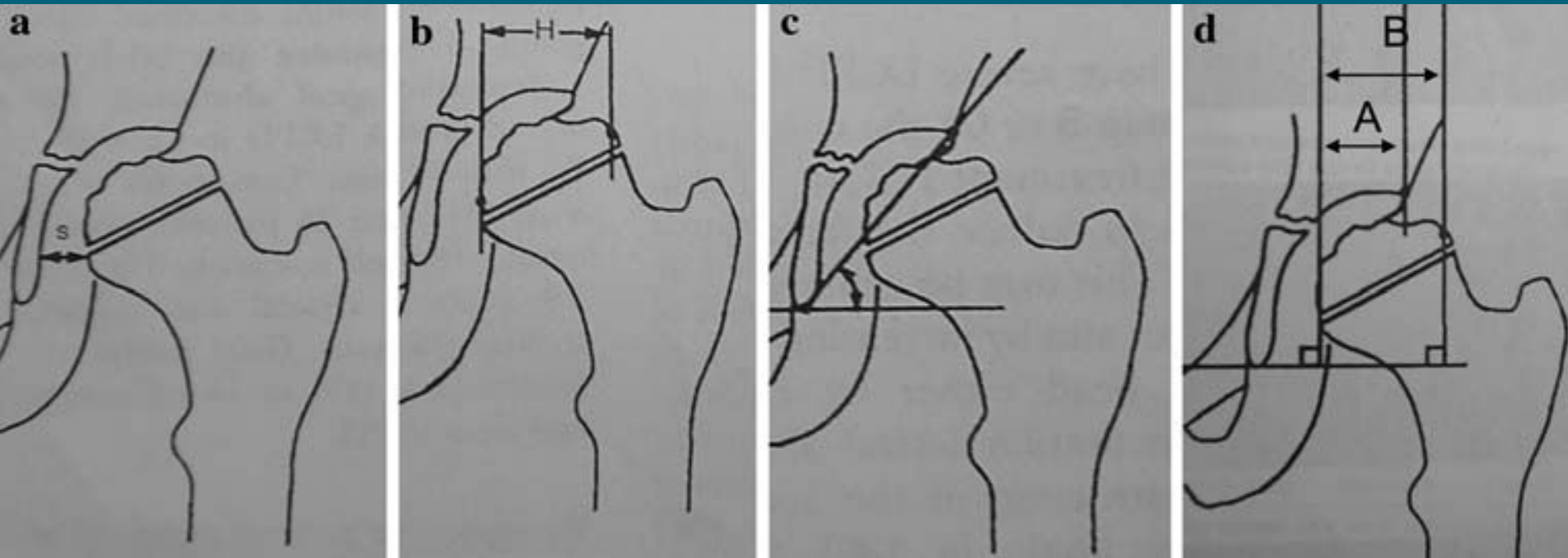
TROCHANTERIC EPIPHYSIODESIS

- Percutaneous multiple drilling screw fixation
- Trochanteric epiphysiodesis achieve 42.3% growth arrest (Gage and Cary, JBJS(A), 1980.) and improve pain, gait and ROM.
- Epiphysiodesis after the age of 8 years may still have an effect on the growth of the greater trochanter. (**Greater trochanteric epiphysiodesis** [James J. McCarthy](#) and [Dennis S. Weiner](#), 2008
- **Effect of prophylactic trochanteric epiphysiodesis in older children with Perthes' disease.** [Shah H¹](#), [Siddesh ND](#), [Joseph B](#), [Nair SN](#). JPO 2009- has a role

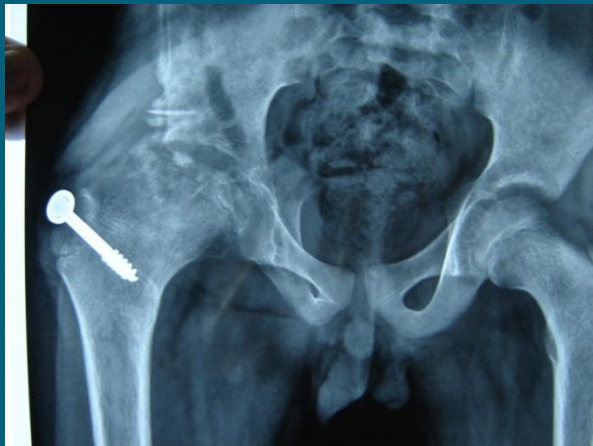
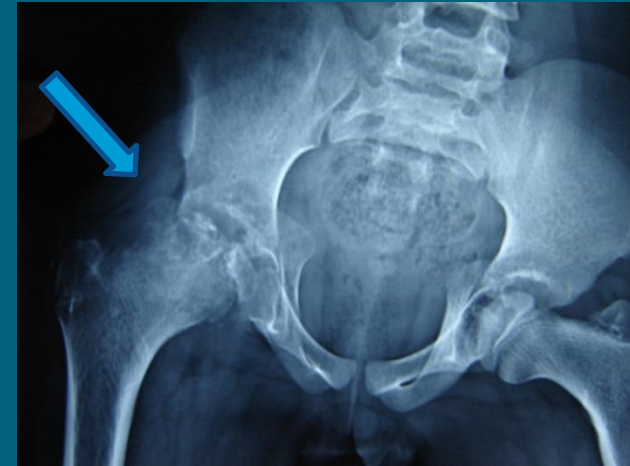
Outcome Measures

- Sphericity of femoral head – Stulberg classification
- Hip passive ROM in abduction and rotation by goniometer
- Iowa Hip Score
- **Radiographic parameters :**
 - Femoral - head subluxation ratio
 - Femoral head size ratio
 - Sharp angle
 - Percentage of acetabular coverage
 - Wiberg center-edge angle (CE)
 - Articular trochanteric distance
 - Neck-shaft angle (NSA)

Measurement of Subluxation femoral ratio (s), b femoral head size ratio between the involved and the normal hip (H), c sharp angle, d femoral head coverage ratio (A/B).



Shelf acetabuloplasty











"BRING MOBILITY"

ସ୍ଵାମୀ ବିଭୋକାନନ୍ଦ କାର୍ଯ୍ୟାଳୟ ପୁନର୍ବ
(ସାମାଜିକ କାର୍ଯ୍ୟ
ଓକେରପୁର, ପୋ.ଅ.)

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FACILITIES AVAILABLE FOR OUTPATIENT'S

ପୋଷାକ, ହାତଗୋଡ଼ ବଦଳାଇବା ବ୍ୟବସ୍ଥା, ଚର୍ଚ୍ଚନା ବିଭାଗ, ଶାରୀରିକ ଯତ୍ନ, ଯୋଗାଯୋଗ, ବେକେଡ଼ର ଚର୍ଚ୍ଚା, ଯୋଗ୍ୟତା ପରୀକ୍ଷା କରାଯାଏ, ହସ୍ତକୁ ଯାତନା କରାଯାଏ। ବିଭାଗୀୟ ଚର୍ଚ୍ଚା ଓ ଉପାଦାନ ପ୍ରଦାନ (ବିଭାଗୀୟ) କାର୍ଯ୍ୟକ୍ରମକୁ ଏହି କ୍ଷେତ୍ରରେ ଉପରେ ବିଭାଗୀୟ ଚର୍ଚ୍ଚା, ହସ୍ତକୁ ଯତ୍ନ ପ୍ରଦାନ କରାଯାଏ ଏବଂ ସାମାଜିକ ଓ ଆଧୁନିକ ଯୋଗାଯୋଗ କରାଯାଏ ।

- ବ୍ୟବସ୍ଥା କରାଯାଏ: ଉପକ୍ରମ ୧୦୦ ଦୈନିକ ଚର୍ଚ୍ଚା ୧୦୦ ଶଯ୍ୟା ବିଶିଷ୍ଟ ହସ୍ପିଟାଲ (100 Bed Hospital including 10 paying cabins)
- ଉପକ୍ରମିତ ଉପକ୍ରମର ଉପକ୍ରମ (Modern Operation Theatres)
- ଯୋଗ୍ୟତା ପରୀକ୍ଷା କରାଯାଏ ଏବଂ ୨୦୦୦୦ ଲୋକଙ୍କୁ ଯତ୍ନ ଦିଆଯାଏ ଏବଂ ଉପକ୍ରମ କରାଯାଏ। ଏହି ବିଭାଗରେ ଯୋଗ୍ୟତା ପରୀକ୍ଷା କରାଯାଏ ଏବଂ ଉପକ୍ରମ କରାଯାଏ ।
- ଯୋଗ୍ୟତା ପରୀକ୍ଷା କରାଯାଏ (Physiotherapy Services)

ବାହ୍ୟ ରୋଗୀଙ୍କ ପାଇଁ
OUT PATIENT'S

Regd. No.: 7512
Name: Gajanan Behera
Address: At: Gheramat
P.S./Via: D
Occupation: Service / Business / Cultivation / Daily
Ref. from: Doctor/Institution/NGO. BPL Card Holder
Diagnosis:
Date with Renewal: 27/11/17
History/Clinical Findings:











Results

- **The radiographic data suggest shelf acetabuloplasty improves acetabular coverage of the femoral head in a frontal plane image obtained via plain radiography.**
- **All participants noted an improvement in clinical parameters studied and also in functional aspect.**

Outcome	Pre-score	Post-score
femoral - head subluxation ratio	1.65	1.32
femoral head size ratio (affected hips versus the contralateral normal Hips)	1.11	1.24
Sharp angle	45	39
percentage of acetabular coverage	58%	82%
Wiberg center-edge angle (CE) (in degrees)	17	32
neck-shaft angle (NSA) (in degrees)	140	120
Stulberg staging-	13 CASES WERE AT MATURITY	I- 2, II-7,III-3,IV-1,V-0
Iowa hip score	71 (30 to 91)	92 (76 to 100)
Range of motion (in degrees) – abduction & Int. rotation	20 15	45 35

Discussion

- Surgical containment is an accepted modality of treatment intended to promote a spherical femoral head at skeletal maturity.
- These containment methods have been advocated even in severe stages (greater head involvement) of LCP.
- Radiographically, all indicators studied improved after shelf acetabuloplasty, suggesting improvement in containment .

Discussion(cont.)

- It promote long-term congruency between the uncovered femoral head and the opposing acetabulum.
- Increases the superolateral coverage of the femoral head by extending the acetabular roof
- Our patients reported an improvement in clinical outcomes - improvement in pain, ROM, and return to daily activities without difficulty, including squatting and cross-leg sitting.
- Full ROM of hip was not achieved in some cases.

Complications

- No complication associated with the operating procedure was noted.

Limitations

- **The long-term goal of surgical intervention is prevention of early arthritis.**
- **Whether this goal is achieved by the shelf procedure is unknown, as our follow-up was limited to 5 to 10 years only.**
- **The radiographic indexes described in our study was based on two-dimensional plain films.**

Conclusion

- Shelf acetabuloplasty for LCPD improves femoral containment as determined by two-dimensional plain radiography, improvements in pain and ROM and is associated with low complication rates.
- More prospective comparative studies are needed to determine whether this procedure provides a long-term benefit to patients by creation of a congruent joint space, continued containment of the femoral head, and prevention of early osteoarthritis.



THANKS FOR
YOUR
ATTENTION