The Effect of Learning Curve in Complications for Open Hip Preservation Surgery"
Enter a new surgical technique.

- The learning curve is determined by:
  - the average operative time.
  - the number of complications.
  - clinical outcomes.

- No data about the learning curve in hip open surgery except in hip arthroplasty.
Enter a new surgical technique.

- THA - minimally invasive incision. Have a significant reduction in the average time of the operation in the first ten (10) cases.

- The amount of complications showed no reduction in spite the number of cases.
Do Complications in Hip Arthroscopy Change With Experience?


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Results
There were 12 complications (6.1%) in this series. Of these, 5 were neurologic (2.6%), 4 were musculoskeletal (2%), and 3 were vascular/ischemic (1.5%). According to severity, 2 were considered major complications (1%), 8 were intermediate (4.1%), and 2 were minor (1%).

The incidence of complications did not change with time ($P = .959$) or with the number of cases performed ($P = .771$), but different types of complications occurred along the learning curve.

Conclusions
The nature of complications changed with experience, but no significant variation in the incidence was observed over the 9-year period of experience with hip arthroscopy.

Level of Evidence
Level IV, therapeutic case series.
Two types of methods are used to assess learning curves:
- outcome assessment.
- process assessment.

Outcome measures are usually dichotomous rare events like complication rates and survival or require an extensive follow-up and are therefore often inadequate to monitor individual learning curves.

Time-action analysis (TAA) is a tool to objectively determine the level of efficiency of individual steps of a surgical procedure.
Expected objective

- EO time = total time - delay
- Delay: repetition, waiting and further action.
- Efficiency: the percentage of uptime.
- It is a representation of the level of difficulty of each procedure for the surgeon.
Depending on the pathology and the type of procedure.

- The learning curve varies between individual surgeons.

- Should evaluate multiple surgeons with different levels of experience.

Time-Action Analysis (TAA) of the Surgical Technique Implanting the Collum Femoris Preserving (CFP) Hip Arthroplasty. TAASTIC trial Identifying pitfalls during the learning curve of surgeons participating in a subsequent randomized controlled trial (An observational study)

Jakob van Oldenrijk¹, Matthias U Schafroth¹, Mohit Bhandari³, Wouter C Runne² and Rudolf W Poolman²
What we want to find out about the learning curve

Process assessment = Efficiency

- The number of cases required for a surgeon to become proficient with a new procedure.

- is directly related to the decline of major complications and better results
PAO
Start Learning Curve

[Images of individuals labeled 'hard' and 'Easy']
What we need to do a good curve?

- Knowledge about hip anatomy.
- Knowledge about hip pathologies.
- Have a good mentor.
- Be expose to see determined number of surgeries before start the learning curve.
- Be able to make consecutive surgeries.
PAO

Complete Learning Curve

hard

Easy
But the main goal is .....  

Three major peri-operative complications in hip osteotomies determined:

1- Massive hemorrhage  
2- Fracture (femoral or acetabular)  
3- Obvious neurological damage
The aim of this study was to determine whether a complex surgical procedure such as peri-acetabular osteotomy could be safely learnt by using a programed involving mentoring by a distant expert.

is an important method of learning complex surgery when prolonged exposure and training under direct supervision is not practicable, a not uncommon situation for senior surgeons faced with the challenge of adopting a new surgical procedure.

A process of mentoring by a distant expert surgeon over more than a decade has allowed a complex surgical procedure to be safely learnt and surgical expertise maintained in a remote centre.
open surgeries is standard technics.

when we started learn a new surgery.

We just have to learn the new steps of the surgery because the technique is the same.

Therefore the learning curve becomes shorter

When a new technique is included (new instruments, new equipment) the learning curve is extended because you have to learn to handle the new equipment.
Periacetabular Osteotomy A Systematic Literature Review
John C. Clohisy MD, Amanda L. Schutz PhD, MPA, Lauren St. John BS, Perry L. Schoenecker MD, Rick W. Wright MD

Majority of the studies represent the learning curve experience of the involved surgeon(s), and eight of the reports discussed the potential for a higher complication rate during the surgeon’s learning curve experience.

in summary

- Our standard technics is open surgeries.
- Each procedure has its learning curve depending on their degree of difficulty.
- Literature does not address the number of surgeries that the surgeon has to see before starting your own learning curve.
- The number of surgeries required to achieve a suitable curve is not clear to the different open procedures.
- When a new technique is included (new instruments, new equipment) the learning curve is extended because you have to learn to handle the new equipment.
- Is clear that the serious complications changes for minor complications with proper learning curve.