

**IPM 2004, Grenoble 2 et 3 décembre**

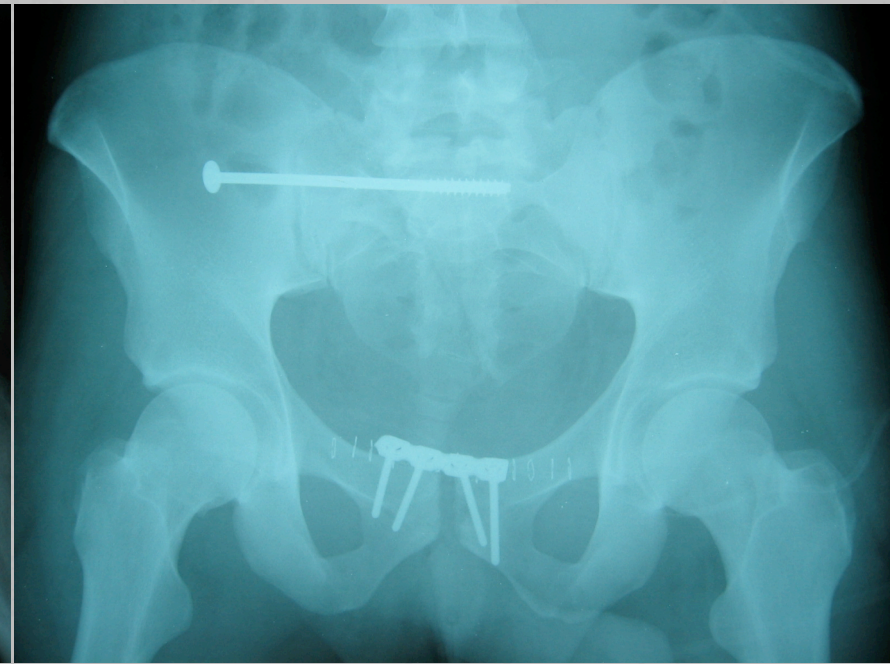
**Problématique de l'enseignement de la  
chirurgie en ligne.  
Application à la simulation d'un geste de  
vissage percutané.**

**J. Tonetti, L. Vadcard, P. Girard, R. Martin, Ph Cinquin, J. Troccaz, P. Merloz**

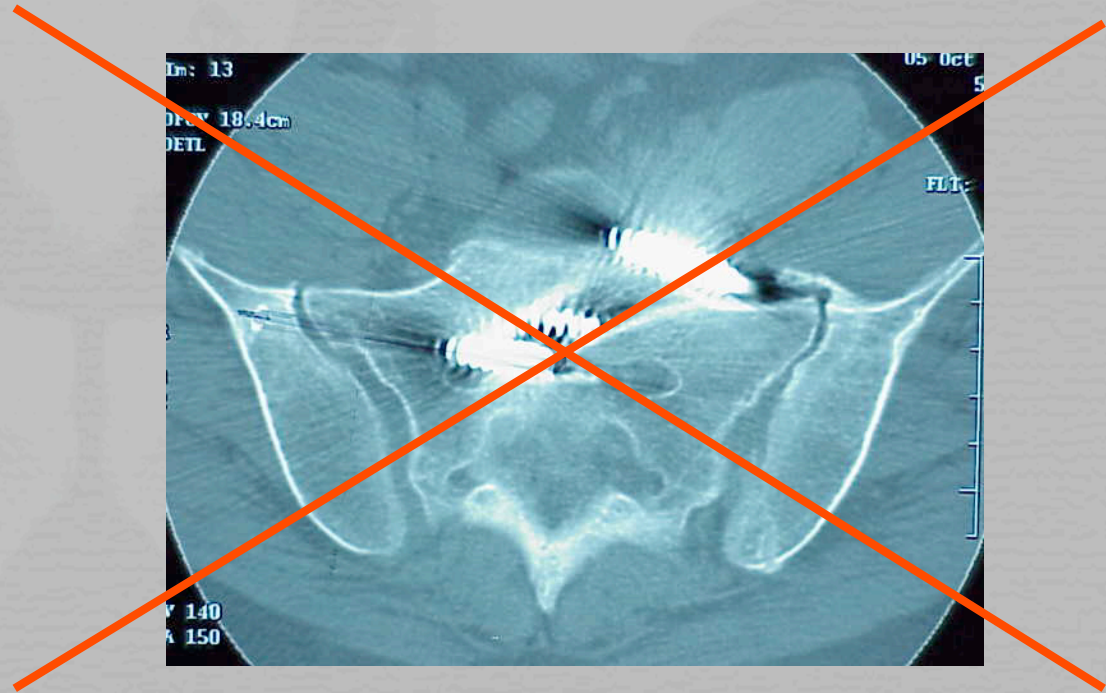
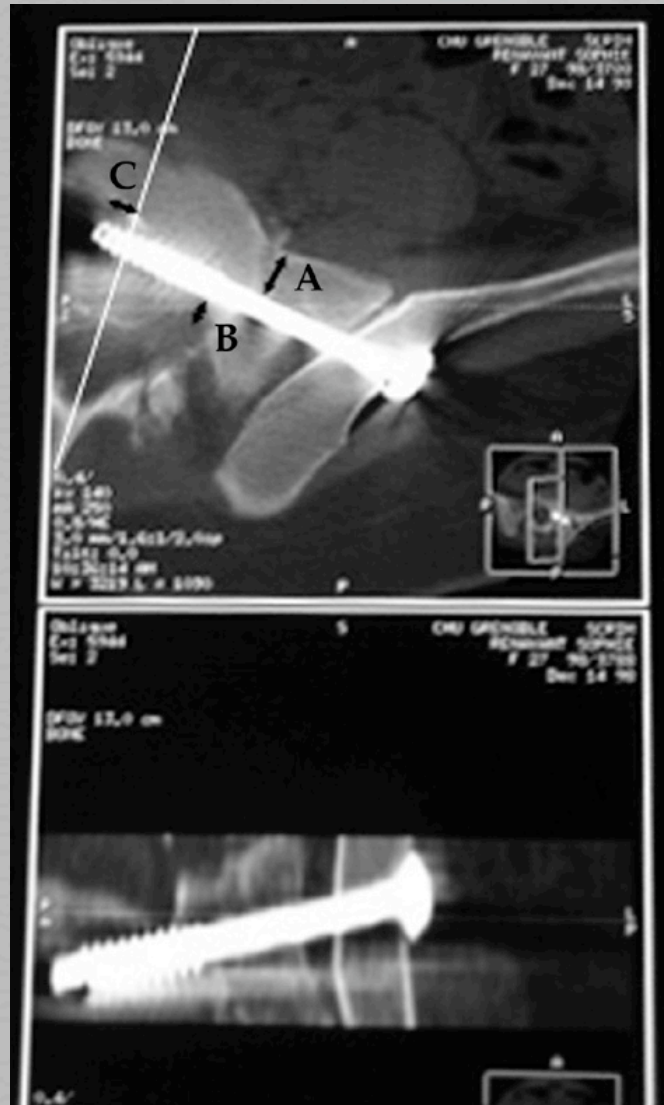
**TIMC Lab - Orthopaedics and Trauma Department  
Joseph Fourier University Grenoble**

**Support by the Virtual Orthopedic European University Project. IST 1999 – 13079.**

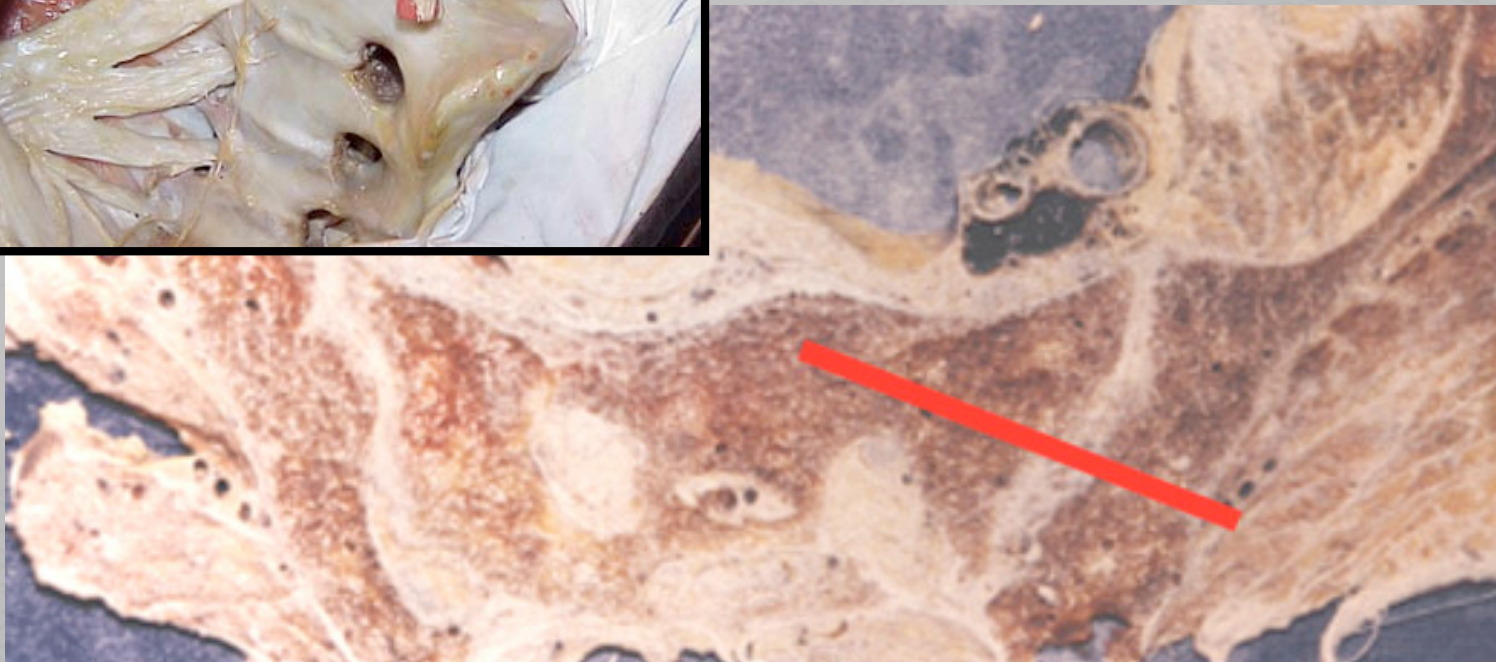
# Percutaneous screwing of posterior lesion of the pelvic ring



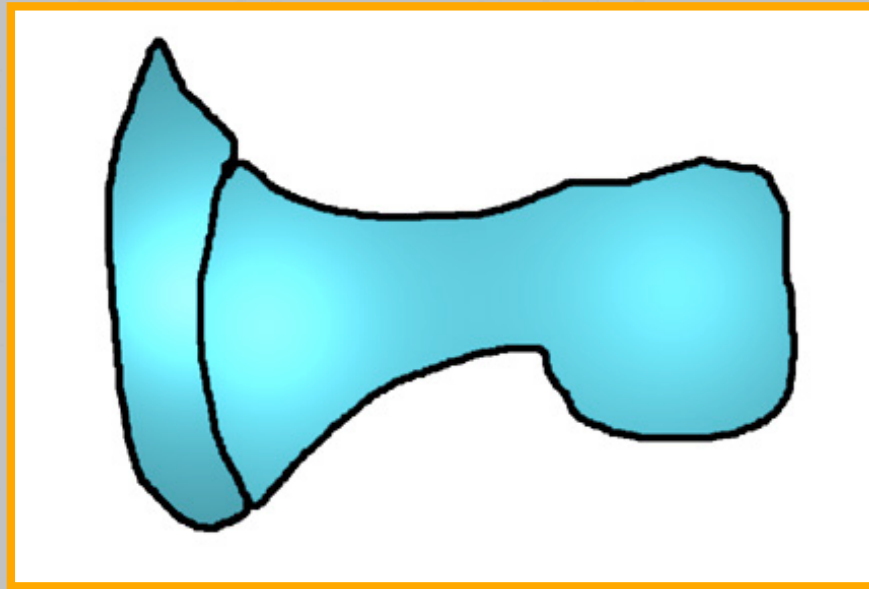
# Strictly intra osseous trajectory



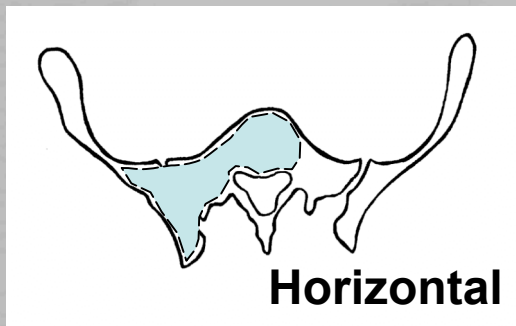
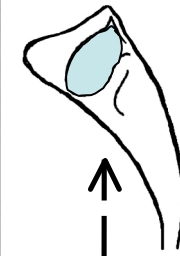
# Strictly intra osseous trajectory



# Sacral ala Volume

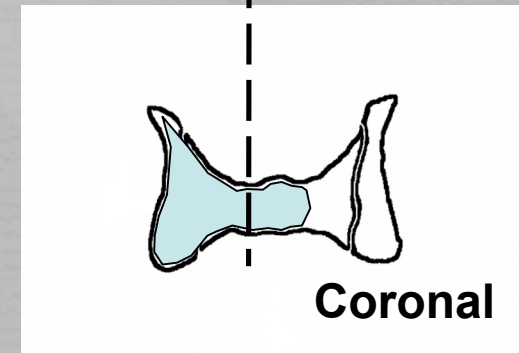


**Sagittal**



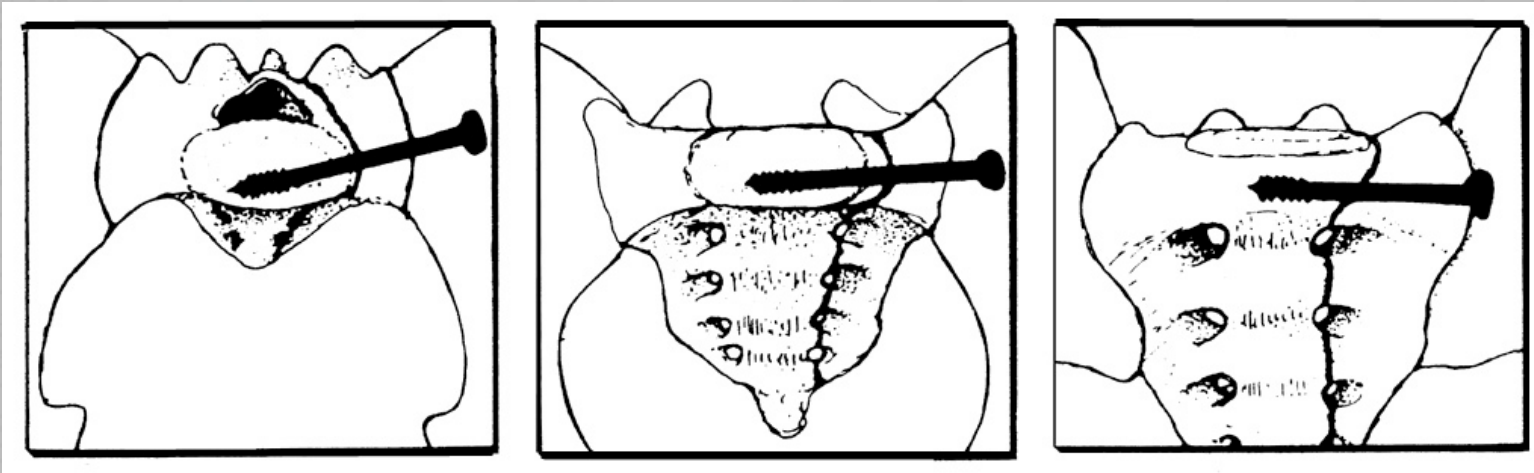
**Horizontal**

**Look like Diabolo**



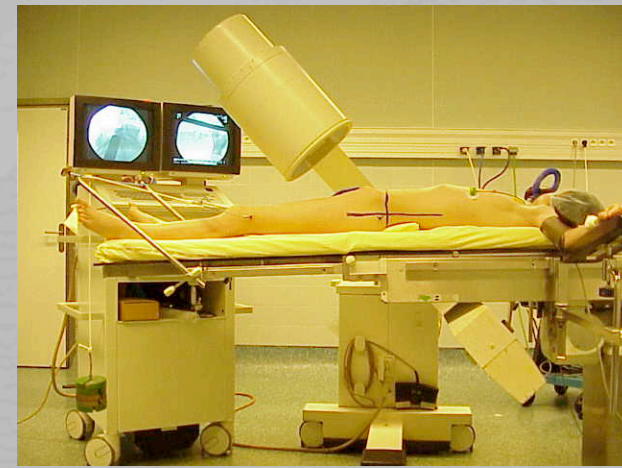
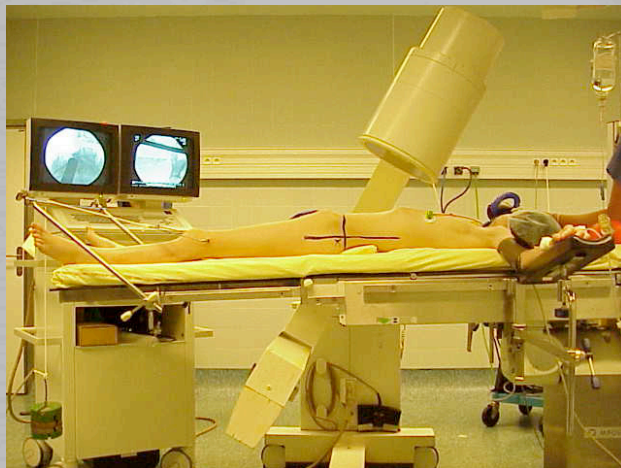
**Coronal**

# Intra operative Fluoroscopy



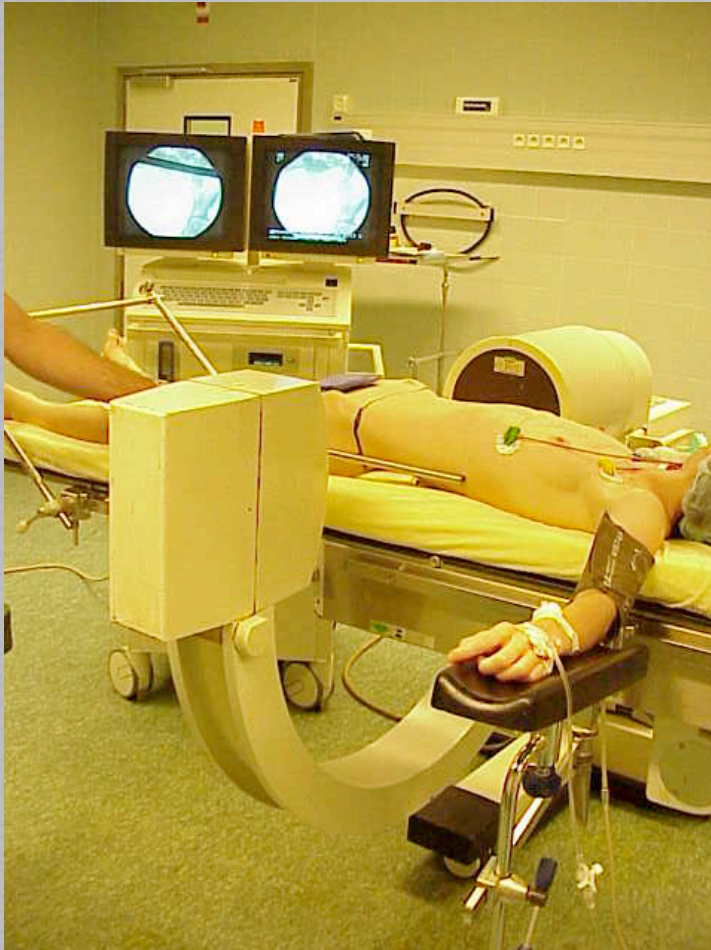
**Inlet**

**Outlet**



**Pennal, Tile**

# Intra operative Fluoroscopy



**Lateral view**



**Routt**

# Learning curve

**68 implanted screws**

**Extra osseous trajectories**

**12 for 44 patients**

**10 in the 17 first patients**

**Training of the junior surgeons**



# Simulator

- **Interactive**
- **3D volume of the sacrum**
- **intra operative fluoroscopic tool**
- **links to declarative knowledges**
- **pedagogical return to the student**

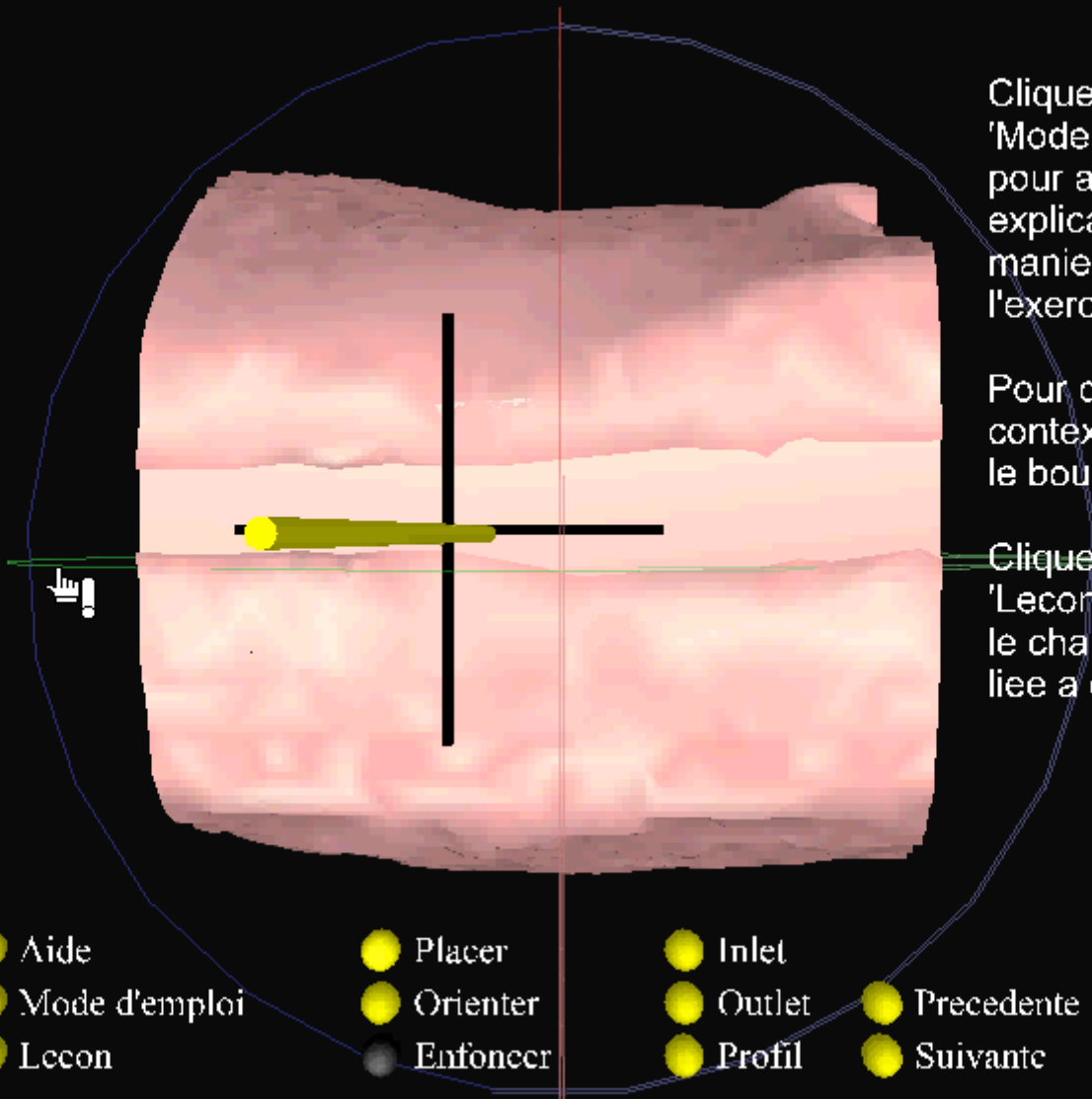
[visang\exerci\\\_ExerciceVOEU.wrl](#)

# Conclusion

**Goal : reduce the learning curve**

**without excessive radiation exposure**

**without iatrogenic lesion of the nerves**



Cliquez sur le bouton 'Mode d'emploi' pour avoir des explications sur la maniere de faire l'exercice

Pour desactiver l'aide contextuelle cliquez sur le bouton 'Aide'

Cliquez sur le bouton 'Lecon' pour afficher le chapitre de la lecon liee a cet exercice.

- |                 |            |          |              |
|-----------------|------------|----------|--------------|
| ● Aide          | ● Placer   | ● Inlet  | ● Retour     |
| ● Mode d'emploi | ● Orienter | ● Outlet | ● Precedente |
| ● Lecon         | ● Enfoncer | ● Profil | ● Suivante   |
|                 |            |          | ● Valider    |

# **Ilio sacral screwing Simulator**

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