

# PIN REMOVAL AFTER IN-SITU PINNING FOR SLIPPED CAPITAL FEMORAL EPIPHYSIS

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**We retrospectively reviewed 28 pin-removal procedures in 20 patients with slipped capital femoral epiphysis, who were all treated by in-situ pinning with Knowles pins. Failure to extract the pins occurred in 8 cases (28.6%), and in another 8 cases (28.68%), pin retrieval was only possible after major excavation of the lateral femoral cortex. In view of these data we do not recommend routine removal of Knowles pins used for in-situ pinning of slipped capital femoral epiphysis.**

**Keywords :** slipped capital femoral epiphysis ; in-situ pinning ; pin removal.

**Mots-clés :** épiphysiolyse fémorale supérieure ; embrochage in situ ; ablation des broches.

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## INTRODUCTION

Fixation with single or multiple pins has been widely accepted as a treatment of choice for either acute or chronic slipped capital femoral epiphysis (1, 2, 3, 4, 6, 11). The objective of this procedure is to temporarily stabilize the epiphysis to prevent it from further slipping and to promote premature fusion of the growth plate. There is however a paucity of information in the literature as to whether these pins should be removed routinely once fusion of the physis has taken place, in consideration of possible later hip surgery.

## MATERIALS AND METHODS

Twenty-eight pin-removal procedures were retrospectively reviewed in 20 patients, who were all previously treated by in-situ pinning for slipped capital femoral epiphysis. In 7 patients both hips were involved and pinned ; in one patient the contralateral side was pro-

phylectically pinned. In all cases multiple Knowles pins were used (range 3 to 6). In 5 hips the pins were removed as a treatment for mild chronic trochanter pain that did not respond to conservative treatment.

In the remaining 23 hips the pins were removed as a routine procedure, to avoid problems if further hip surgery is indicated at a later stage.

The procedure was considered a failure when not all the pins could be fully retrieved. The procedure was considered as very difficult when such difficulty was explicitly mentioned in the operative report, and when major cortical fenestration had been necessary to remove the pins. The postoperative x rays were compared with the preoperative views to assess the amount of cortical bone removal.

All procedures were performed by residents assisted by a staff member, who took over when the procedure was not straightforward.

The pins were removed after an average period of 2 years 4 months postoperatively (range 8 months to 7 years). All pins were removed within one year after physeal closure time and before the third postoperative year, except in 2 hips, where they were removed after 4.3 years and 7.0 years. The average physeal closure occurred at 1 year 5 months postoperatively (range 7 months to 3 years).

## RESULTS

The procedure was considered as failed or very difficult in 16 cases (57%). In 8 hips (28.6%) failure to remove all the pins in total was seen. In 5 of these the head of one or more of the pins broke off during the attempt to screw them out. In the

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remaining 3, one or more screws was left in place because of significant bone overgrowth over the screw heads, after major decortication had already been performed to reach the pins. In only one of these hips was the removal procedure performed more than one year after physal closure time (4.5 years after physal closure ; 7.0 years post-operatively).

In another 8 hips (28.6%) the pins could only be removed after a difficult procedure, necessitating major excavation of the lateral femoral cortex to reach the screw heads. Again, in only one of these hips was the removal procedure performed more than one year after physal closure time (2.3 years after physal closure ; 4.3 years postoperatively).

In 12 hips the procedure was without technical difficulty.

In total, 19 (20.65%) of the 92 screws could not be retrieved.

The 5 patients with trochanteric pain preoperatively were free of symptoms after the procedure, although in one of them none of the pins could be removed due to breakage of the screw heads, and in another patient a single pin could not be retrieved.

## DISCUSSION

In the literature little has been said about pin removal after in-situ pinning for slipped capital femoral epiphysis. Pin breakage and bone overgrowth have been described with several types of pins (5, 8, 13). Whether the pins should be removed routinely remains unclear, although some authors report a failure rate for the removal procedure of 10% to 19% (5, 7, 8, 13).

In our study, problems with the procedure were seen in 57% of the cases, with a failure to remove the pins in 28.6%, and a difficult procedure necessitating excavation of much of the lateral femoral cortex in another 28.6%. However, the removal procedure was performed in all but two cases within one year after physal closure time.

On the other hand, in-situ pinning of a slipped capital femoral epiphysis gives excellent long-term results, with only a minor percentage of the hips developing chondrolysis or osteonecrosis (less than

10%) and possibly necessitating further surgery (4, 9, 10, 12, 14).

In view of these data we do not recommend routine removal of Knowles pins, used for in-situ pinning of a slipped capital femoral epiphysis, once fusion of the physis has taken place.

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**SAMENVATTING**

*J. BELLEMANS, G. FABRY, G. MOLENAERS, J. LAMMENS, P. MOENS. Verwijderen van Knowles-pinnen gebruikt na behandeling van epiphysiolyse van de heupkop.*

Retrospectief werden 28 ingrepen ter verwijdering van Knowlespinnen nagekeken bij 20 patiënten, behandeld voor epiphysiolyse van de heupkop. Acht maal (28.68%) was het onmogelijk de pinnen te verwijderen en bij 8 andere patiënten lukte de ingreep slechts na ruim uithollen van de laterale femorale cortex. Blijkens deze gegevens raden wij het routinegewijs verwijderen van de Knowles-pinnen gebruikt bij epiphysiolyse, niet aan.

**RÉSUMÉ**

*J. BELLEMANS, G. FABRY, G. MOLENAERS, J. LAMMENS, P. MOENS. Ablation des broches de Knowles après traitement d'épiphysiolyse de la tête fémorale.*

Étude rétrospective de 28 ablations de broches de Knowles après traitement d'épiphysiolyse de la tête fémorale chez 20 patients. Huit fois (28.68%) l'ablation du matériel s'avéra impossible, et chez 8 patients l'opération réussit après creusement extensif de la corticale externe du fémur. A vu de ces données nous ne conseillons pas l'ablation de routine des broches de Knowles.