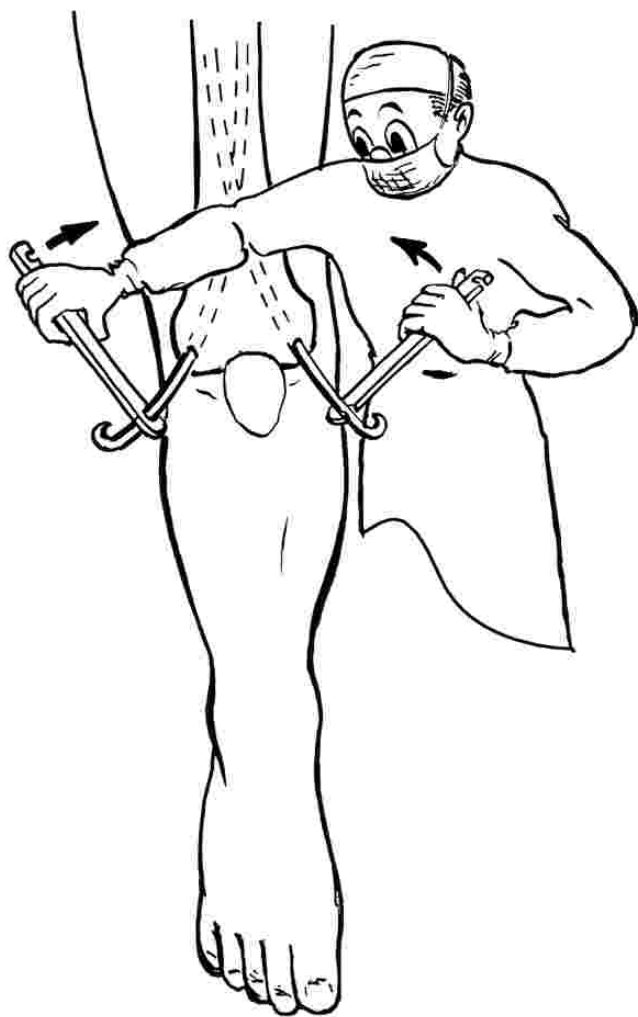


# 11 USE OF BENDING IRON



**N E V E R**



**A L W A Y S**

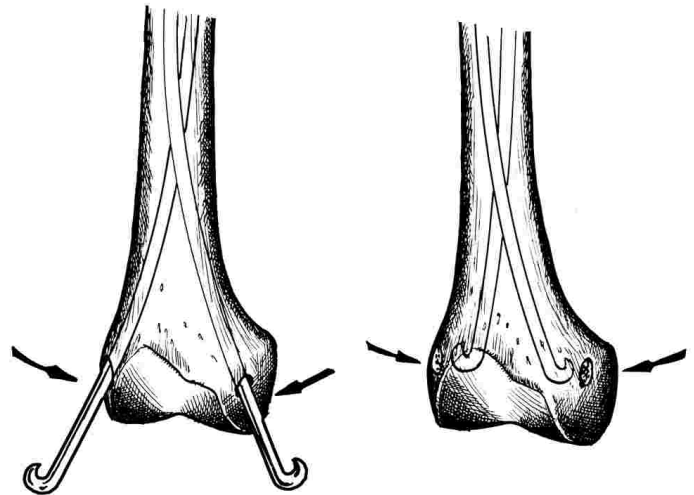
It now should be apparent that medullary pinning is not a stereotyped procedure to be indiscriminately applied. One must deal constantly with dynamic forces. The results can be brilliant or disastrous, dependent upon the intelligence with which these forces are utilized. We humbly beg that no surgeon embark upon this course without thoroughly acquainting himself with the important factors involved and the potential dangers that may not at first be recognized.

The bending iron can play an important role in this drama of dynamics. At times a slight curve properly applied to a pin can make the difference between union and non-union. It might be desirable to give a slight curve to the entire pin, or perhaps only the head or the pointed end needs preshaping. These points will be developed as specific fractures are discussed.

There is one general rule worth remembering — when a pin is to be preshaped, the convexity of the curve is always in the direction opposite that of the hook and the point.

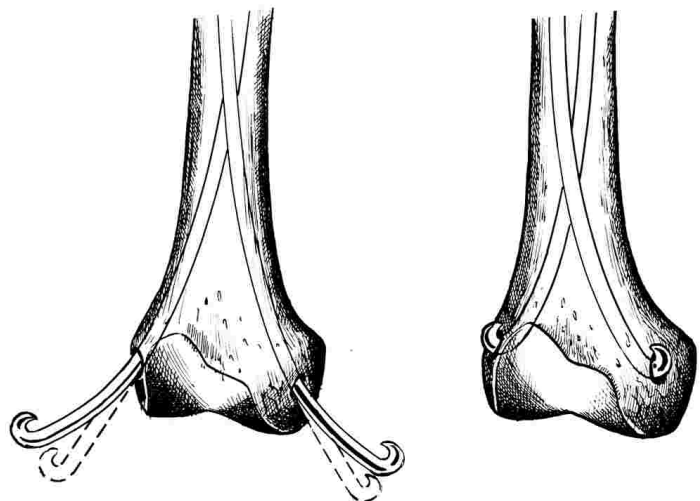
## Migration of Head by Pressure

A straight resilient pin entering a bone in this manner is forced into a curve, continuously exerting pressure at three points. The pressure exerted in a medial direction by the head of the pin can cause it to sink gradually into the substance of the bone to such a degree that it cannot be removed. This tendency is most conspicuous when a pin is introduced through the sides of the large condyles. It must be especially guarded against in the osteoporotic bone of the aged.



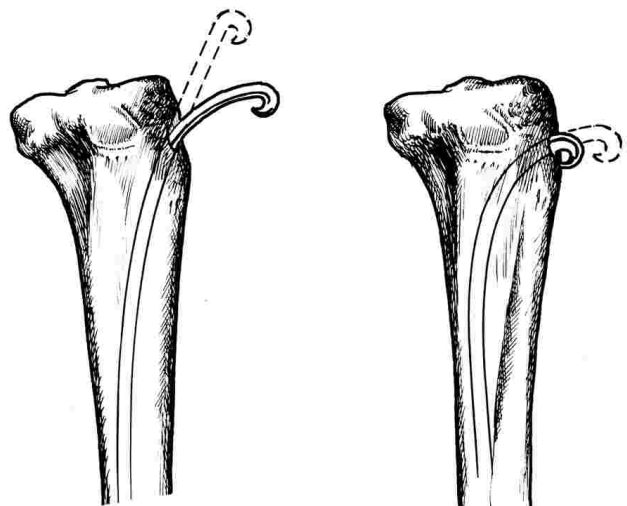
## Stress Relieving Head

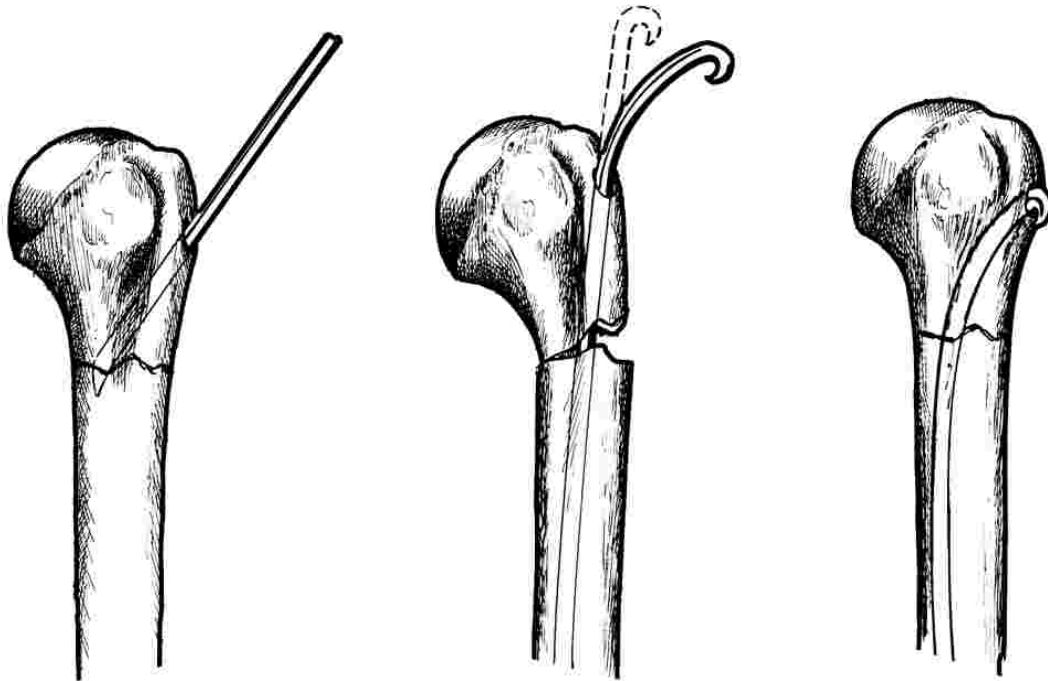
If the head portion of the pin is given a slight curve with the bending iron, it can be made to conform more accurately to the contour of the bone. So doing relieves the spring like tension and the heads remain in proper position.



## Too Much Bend

In other regions the tendency for the heads to sink into the bone substance is less marked but can be very noticeable in the thin bones of elderly and debilitated individuals. A very slight bend at the head end might remedy this situation, but if too much curve is given the pin, the stable purchase on the fragment might be lost and the head of the pin becomes too prominent in the soft tissues and contribute to mechanical irritation.

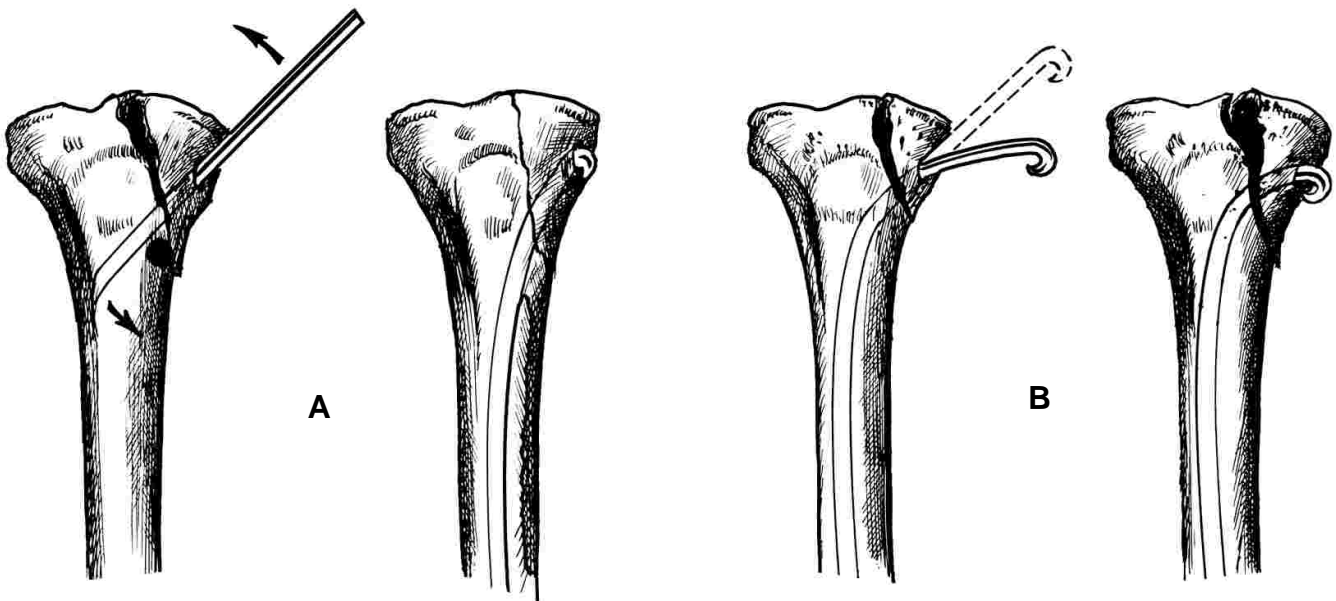




### To Compensate for Angulation

When a pin enters a short fragment at the wrong angle, angulation of the fragment occurs as the shaft of the pin travels down the medullary cavity of the bone. This deformity might be corrected

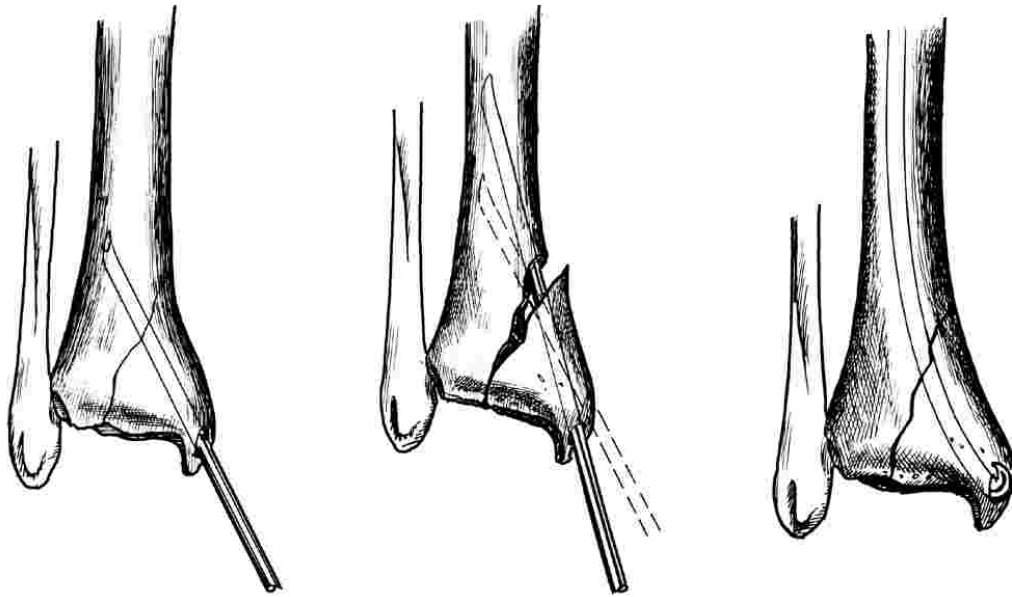
by giving a curve to the pin at a level corresponding to that of the fracture. A better procedure would be to withdraw the pin and reinsert it at the proper angle.



### Vertical Fractures

In transfixing a vertical fracture such as that of a tibial condyle, using a straight pin, the fragment is forced medially by the force of the pin to compress and close the fracture cleft. (A)

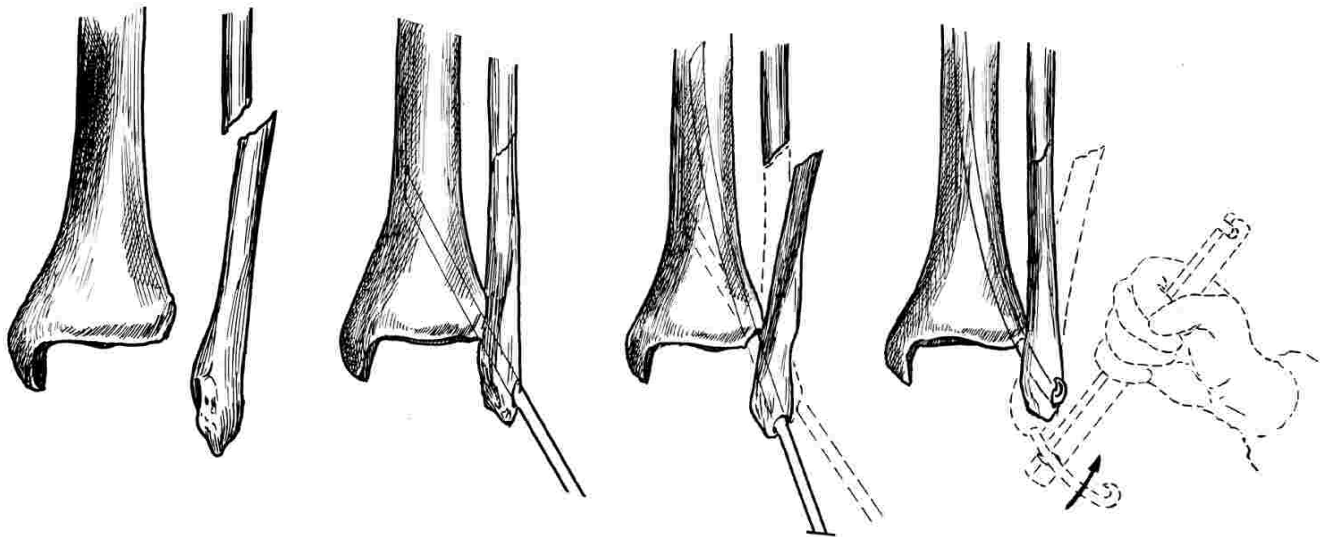
But if the proximal portion of the pin is given much of a curve, this compression force is lost and the fracture cleft remains open. (B)



### Curving Pin to Prevent Distraction

The see-saw action of a pin can rock or rotate a fragment to produce distraction. Example: internal malleolus tibia. A relatively long pin gives good fixation. It passes through the cancellous bone uneventfully, but when the point strikes and is deflected by the far cortex, the pin begins to rock on a fulcrum within the shaft of the bone.

The head of the pin is forced medially in such fashion that the malleolus angulates and the fracture cleft opens widely. Curving the pin at the fracture level will allow the fragment to return to its proper position and close the cleft as the pin is driven completely home.



### Tibio-Fibular Diastasis

A straight pin passed obliquely through the tibio-fibular joint might react similarly to the above to angulate a fractured fibula. The pin can be given

a curve by the bending iron in such fashion that the deformity of the fibula will be corrected.