

Tangential Projection of the Patella

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Patellofemoral instability occurs frequently and is a complex knee malady.¹ It is caused when the patella slips from its normal passageway in the intercondylar sulcus during normal flexion an extension maneuvers. When this happens, the physician may request radiographs to measure the "Q" angle. This angle is determined by drawing 2 lines on an anterior posterior (AP) radiograph. 1 line is drawn from the mid patella to the anterior superior iliac spine (ASIS), and the second line is drawn from the tibial tuberosity to the same midpoint of the patella. The greater the angle at which the 2 lines intersect, the greater the chance of patellofemoral instability.² Additionally, axial radiographs are often used to determine the relationship of the patella to the distal femur. These axial radiographs are useful to determine the likelihood of subluxation and to evaluate the shape of the patella.

Several axial projections can be used for the evaluation of this problem. These projections include: the Merchant Method, the Hughston Method, the Settegast Method and the Inferosuperior axial projection. Each of these projections have been described in radiographic positioning textbooks.³⁻⁵

The Merchant Method is performed by using an adjustable cassette holder and leg support device. The patient flexes the knees to 40° and places them over the end of the x-ray table and rests the legs on the device. The x-ray tube is directed with a caudad angle of 30°. A similar inferosuperior projection can be taken with the patient in the supine position with the knees flexed 40-45°. The x-ray tube is directed 10 to 15° to pass through the femoropatellar joint.³⁻⁵ A disadvantage to the Merchant Method is that it requires an apparatus to perform the maneuver. Additionally, both of these projections

require an awkward horizontal placement of the x-ray tube. In spite of these difficulties, these projections yield exceptional images of the patellae. Furthermore, the Hughston and Settegast Methods require the patient to lie prone, which is often difficult for trauma patients.

Though all of these positions are important and should be part of a radiographer's repertoire, it is the intent of this article to review a nontraditional method of obtaining a tangential projection of the patellae. The nontraditional method was described by Watkins and Moore⁶ in 1993. The advantage of this

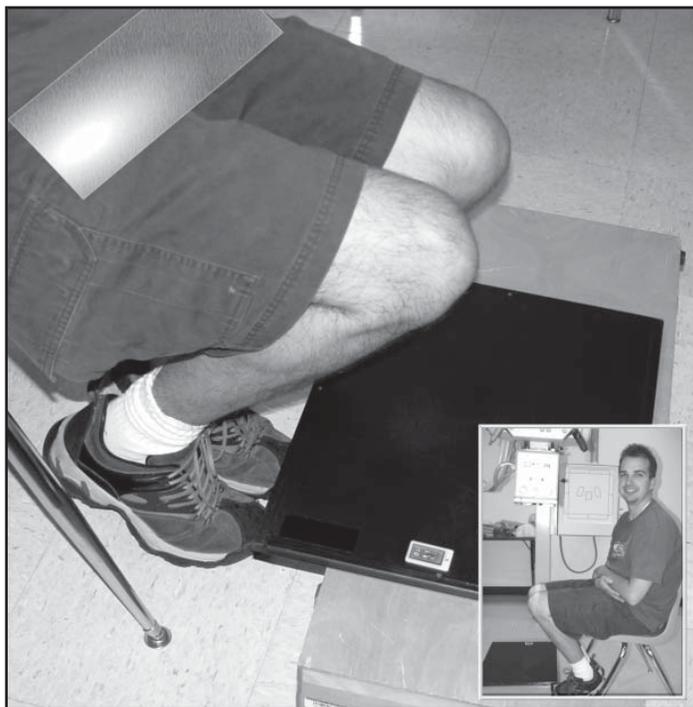


Fig.1. Sitting Tangential Position with knees flexed; in this example the cassette is raised from the floor to decrease OID by sitting it on a box.

method is that it is quick and easy to perform; however, the disadvantage is that it requires acute flexion of the knees, which is impossible in all scenarios. Regardless, the technique described is valuable and yields excellent visualization of the patellae, but can only be performed on patients that can sit and bend their knees.

Sitting Tangential Position

Methods

The patient should be seated in a chair. Both of the knees should be flexed with the feet placed underneath the chair. (See Fig. 1.) The cassette should be built up on sponges or some type of support to reduce the object to image receptor distance (OID) as much as possible. The central ray (CR) is directed perpendicular to the imaging receptor (IR) and parallel to the patellarfemoral joints. The resulting radiograph clearly delineates both patellae. (See Fig. 2.)

Discussion

This position is easy to perform on mobile patients and requires little manipulation of the x-ray tube. Likewise, Watkins and Moore emphasize that magnification of the patellae can be reduced by increasing the source to image receptor distance (SID) to 50 inches (127cm) or more.⁶

A disadvantage of this method is that the position requires acute flexion of the knees; thus, 1 of the aforementioned projections would be advised if acute flexion is not possible. In comparison to its counterparts, the Sitting Tangential Position can also be performed as a bilateral or unilateral exam. This position yields equivalent results without the need of angling or horizontally placing the x-ray tube. This eliminates the need for an apparatus to hold the cassette.

Optimally, the position described in this article may be of use by radiographers in certain scenarios. Perhaps this projection will be useful the next time you are asked to perform a sunrise or skyline projection. Regardless, it is an innovative position and could be a valuable part of a radiographer's personal protocol.

References

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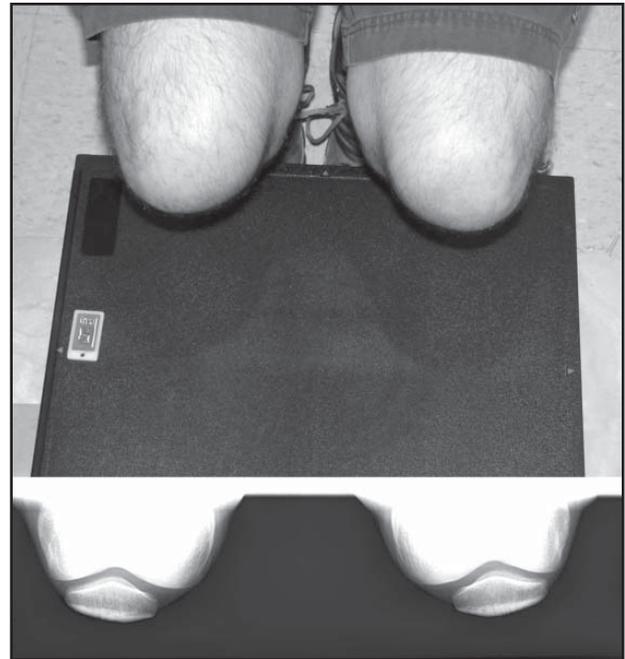


Fig. 2. Superior view with resulting radiograph.

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