QUADRICEPS WASTING IN RELATION TO INJURIES INVOLVING
THE ANKLE JOINT
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The importance of quadriceps and gluteal exercises
for injuries involving the ankle joint, have, in the past,
been overshadowed by the primary aims of mobilising
and redeveloping the ankle and foot movements, muscles
of the lower leg, and longitudinal and transverse arches
of the foot.

Of 40 cases seen within 48 hrs. of injury, who were
capable of weight-bearing and placed on immediate
re-educated walking, ankle and quadriceps exercises:

Two weeks after injury:—
11 showed wasting of ½" thigh circumference
29 showed wasting of ½-¾" thigh circumference.

This measurement was taken 4” above the upper pole
of the patella. This loss recovered once full mobility was
achieved, although this recovery time varied consider-
ably in individuals. These observations were made over a
period of two years. Many cases could not be included
due to various lengths of time before their appearance at
the clinics although the wastage was obvious.

The functional and mechanical action that takes place
when there is restricted ankle movement consists of
abducting and externally rotating the leg with the knee
joint extended, using the heel as a point of pivot.

There are two reasons for this:

Firstly, this action allows walking to take place with
the minimum of movement at the injured joint, thereby
preventing unnecessary pain and discomfort. It is
basically a natural protective action.

Secondly, it allows long strides to be taken with the
good limb, and, by carrying the injured limb through in
the abducted position, it enables a fairly fast form of
ambulation.

It is for these reasons that careful attention should be
given to re-education in the correct walking technique.

It cannot be over-emphasized that the first two
lessons of re-education in walking must be given under
careful supervision, and with appropriate explanation.
Once the "short step" walk has been mastered, improve-
ment will become fairly rapid, giving immense confi-
cence. It should be remembered, that the patient must
be made aware of the fact, that, as early movement is
 gained, there will be some pain and swelling, and that
when resting the limb, it should be elevated. Also, that
as the movement increases, so the pain will diminish.

Periodic supervision of correct walking is usually
necessary for at least two weeks, by which time, the
patient should be walking correctly with short paces. It
will be found that progress will be gained by teaching
the patient to walk with the feet approximately four
inches apart, with the toes pointing to the front. This
gives a squarer base for stability, and to walk in this
manner, true ankle movement is required.

Having taught the patient the correct "short step"
walk, we are faced with two groups of muscles, namely
the quadriceps and the gluteus maximus, being restricted in
their mechanical functions, because the limited ankle
movement will cause the patient to walk with the knee
joint slightly flexed. This knee flexion commences with
the beginning of the stride, and is continued throughout
the whole movement, inevitably causing a relaxation of
the hamstrings and wasting of the vastus medialis
muscle, with a potential contracture of the posterior
part of the capsule of the knee joint. This in itself gives
rise to a feeling of weakness and instability. In a similar
manner, because of the "short step" walk that the
patient has been taught, the gluteus maximus is not fully
required to extend the thigh at the hip joint, thereby
restricting the range of the muscle function.

Static quadriceps and gluteal contractions should be
commenced as early as possible, and, after correct
walking has been obtained with lessening of painful
movement, it is then advisable to advance to graduated
resisted exercises. It should be remembered that, if the
patient starts to feel unstable at the knee joint, com-
bined with the already conscious knowledge of the
injured ankle, he will immediately restrict his activities,
thereby retarding his own recovery still further.

In bilateral cases there will be found an even greater
tendency to walk with the knees flexed. It may be
doubted at first that a wasting of quadriceps and gluteus
maximus occurs in injuries involving the ankle joint, but
if the two limbs are compared, it will be found that, in
seven cases out of ten, the wasting is easily seen,
especially at the site of vastus medialis. This wasting is
even more pronounced in cases of fracture of the os
calcis, where walking is usually very restricted in the
early days of treatment, and this especially so in bilateral
fractures although there are, of course, other factors to
be taken into consideration in this type of case.