



MANAGING ANTERIOR KNEE PAIN IN GYMNASTICS



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Do you or one of your gymnasts experience knee pain when running, jumping or landing? Is the knee pain centered around the knee cap (patella)? Do you feel a grinding sensation of the outside part of the knee cap? If one or more of these are true you might be suffering from a condition called patella femoral syndrome, or PFS. In layman's terms, this means that the patella for which it is known in medical terms, is not moving properly through the groove at the bottom end of the thigh bone (femur). See Fig. 1.

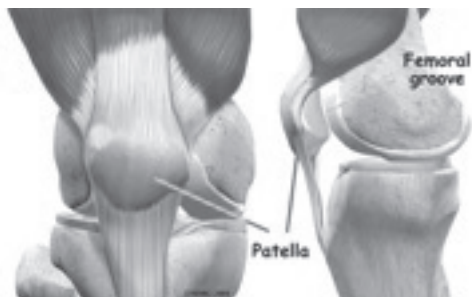


Fig. 1

PFS can be caused by a number of different factors. We will focus on the three major factors which cause this condition. The first is weakness in the vastus medialis oblique (VMO) which is the inner most quadriceps muscle. It is the one that makes the tear drop shape just above and to the inside of the patella. The second is tightness in the vastus lateralis or the outer most quadriceps muscle. Lastly, is a weakness in the gluteus medius or the hip muscle that takes the leg away from your body from the mid line. Usually it is more than one

of these factors that causes the PFS.

Determining which of these issues are causing your PFS can be broken down into three easy evaluations. For the VMO, have the gymnast sit with his/her legs straight. The gymnast should point his/her toes towards the ceiling and tighten the thigh muscle (quadriceps muscle). Now feel the VMO. A strong VMO should feel very taut. A good rule of thumb for how taut, is place your thumb and pinky finger together and pinch them together as hard as you can. Now feel the muscle at the base of the thumb. See how that does not give? That is how taut the VMO should be. Now compare both VMOs. Is one bigger than the other? Is one harder to depress than the other? If this is true the athlete may have a weak VMO (Fig. 2).



Fig. 2

Now evaluate the vastus lateralis or the outside quadriceps muscle (Fig. 3). Have the gymnast lay on his/her side with the affected leg on top. Once he/she is relaxed feel his/her outside quadriceps. You will have to push and feel moving from the top of the outside quadriceps down to the table. Does the muscle feel tight, even though he/she is relaxed? Does pushing on that part of the

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Fig. 3

muscle cause the gymnast discomfort? When the gymnast tries to stretch the quadriceps, does he/she feel the stretch in the outer part of the muscle first? These are all signs of a tight vastus lateralis.

For the final test have the gymnast stand on one leg and squat (Fig. 4). The knee should stay over the foot and should not pass the toes when he/she squats. When he/she squats does his/her knee turn inward? If the knee moves inward past the foot or forward past the toes this is a sign of a weak gluteus medius. Another good sign to test the gluteus medius is to watch the gymnast's landings off of an apparatus. When he/she lands is his/her knees pointed towards one other? If they are, this shows signs of a weak gluteus medius muscle.

Now that we have figured out the problem, here are some simple ways to help combat them. For the VMO have the gymnast do a toe out straight leg raise (Fig. 5). Have the athlete sit with the unaffected leg bent and the other straight



Fig. 4

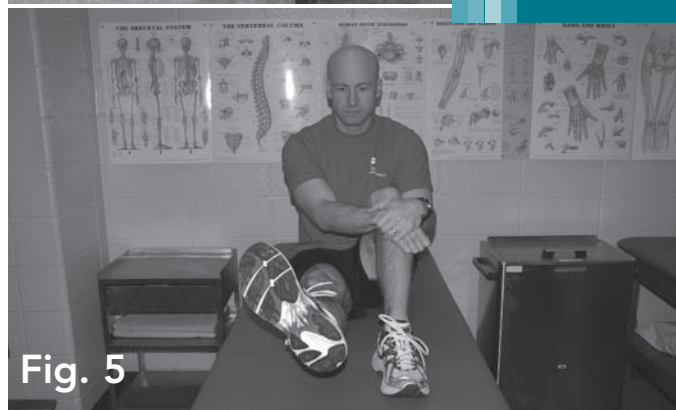


Fig. 5

THESE EXERCISES ARE THE FIRST STEPS ON YOUR WAY TO RECOVERY.

with their toes pointed out at 45 degrees from the mid-line. Have the gymnast hug his/her bent leg. Now ask the gymnast to slowly lift his/her straight leg about 6 inches while keeping his/her knee completely straight. Have him/her count to three and repeat for three sets of 10 repetitions.

For the vastus lateralis you will need a foam roller to treat the muscle tightness most effectively (Fig. 6). Lay the foam roller on the ground and have the gymnast lay across it with the outside of his/her knee on the foam roller. Now have the gymnast roll over the roller with it rolling up until it almost reaches his/her hip. Have the gymnast roll for 60 seconds. This should be done five times. The gymnast can also rotate forward on the roller to involve more of the quadriceps.

There are a number of strengthening exercises for the gluteus medius. Beginning with simple exercises such as "clam shells" can greatly benefit the athlete (Fig. 7). To perform the "clam shell" exercise, have the athlete lay on his/her side on a table. The athlete's spine should be in a neutral position with the knees bent to 90 degrees. Place a theraband around the legs just above the knees. The athlete should keep his/her feet together while "opening" the knees. This movement should be done in a slow and controlled movement. This exercise can be done in three sets of 15 repetitions. Weights can be placed on the top knee to increase the intensity of this exercise. Next we can progress to a single leg step-up with an elastic cord to activate the VMO. This should be done with the knee in line with the toes and the knee should not go forward past the toes (Fig. 8).

These exercises are the first steps on your way to recovery. As pain decreases and strength increases the gymnast can return to sport specific skills and conditioning. If things are not improving over a period of two to three weeks, seek the advice of a Certified Athletic Trainer or physician for a more in depth evaluation. ✧

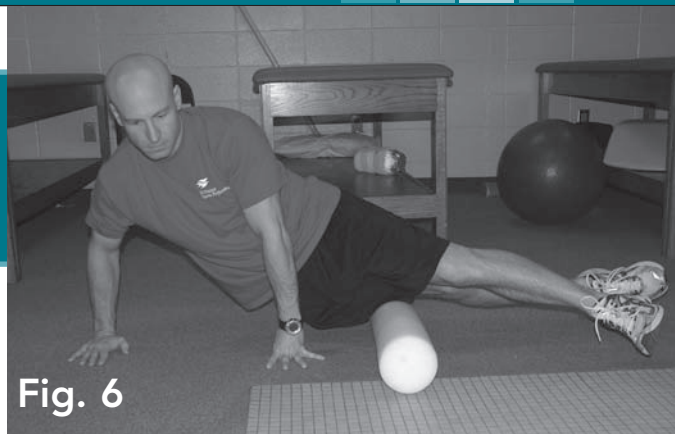


Fig. 6



Fig. 7



Fig. 8