COMMON MISTAKES OF THE SHOT PUT TECHNIQUE
- CAUSES AND CORRECTION -

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Abstract
The paper aims to help the young coaches acting in their early career by detailing common mistakes made by the shot putters and by offering recommendations for their correction. Our research assumes the presumption that the shot putters' training is generally based on throws without take-off, force and speed, at the expense of technical gesture efficiency. To reach the goals, we set and achieved the following objectives: discovering the mistakes that occur more often in the shot putters technique and the causes of their occurrence, finding appropriate means to prevent or correct them and suggesting the best solutions for preventing and combating them. Necessary data were collected through dialogue with coaches having a track record of medals and titles, which allowed us to obtain a large amount of information in short time and with no material cost, to which was added a vast bibliographical study of literature held in CCPS or provided by many internet sources.

Keywords: track and field, shot put, technique, mistakes, exercises.

1. Introduction

A coach masters the art of exploiting the motile potential of an athlete, but a valuable coach knows the importance of the correct technique acquiring, both in children and juniors but also in high-performance athletes, because the compliance of the most insignificant detail differentiates the winner from the rest of the team.

Shot puts are not easy attempts. Their correct bio-motile execution implies a high degree of difficulty and inherent smaller or greater mistakes in technical execution.

2. The issues addressed

The take-off in athletic throws means to effectuate a displacement leading to an initial speed that will be subsequently accelerated through the final effort. One of the essential feature of take-off is the great speed of lower body displacement, causing the so-called "overcoming of the material", the primary source of mistake.

The final effort is constituted by an algorithm of movements that combines the speed obtained through take-off and the speed resulted from direct application of the muscular force upon the object. The final effort is based on the compliance of several criteria: the main action of large muscle groups, optimum angle and height of release; the last two must not be disregarded in favor of the extension of trajectory of the object, all three conditions being the origin of other numerous mistakes.

Mistake 1: the shot putter does not push the weight with the fingers (he does not complete the throw).

Cause/Effect: the weight is in contact with the palm of the hand (incorrectly), instead of being supported on the distal extreme of metacarpals (at the base of the fingers). In this way the high contraction speed of the palmar flexors cannot be put into value because by holding the weight with the palm, the lever of the arm is reduced together with the stroke length and the release speed of the weight.
Correction: will be made first by the repetition of the correct grasp of the weight, then by practicing the specific thrusting action using combined throwing exercises with balls and weights of various size. In these exercises, focus should be put on pushing movement of the fingers.

Other exercises:
- pushups with palms in extension and rising on fingers, or pushups with detachment from the ground;
- medicine ball throw with two arms from the chest (emphasizing the impulse action of the fingers) in standing, sitting or lying position by lifting the trunk;
- from standing, bearing the weight at the hip level with one arm and pushing it toward the ground;
- from standing with legs apart, throwing the weight with one arm vertically;
- throws from standing position.

Mistake 2: throwing weight without pushing.

Cause/Effect: because the skill of pushing is less natural than throwing, the beginner is tempted to throw the weight, detaching it from the neck area and lowering the elbow of the throwing arm under the level of the shoulder. The effect is that the projection of the forces resulted from the movement of the lower body falls outside the launching surface, causing decrease of the launching angle and reducing of releasing speed. More than that, this technique is not allowed by the competitive regulations and the throw will not be considered. Because of less using the arm levers, the athlete may have elbow and fingers pain after such throwing (left without support, they give up due to the inertia of the weight).

Correction: the repetition of the correct manner to hold the weight on the right sight of the neck in the supra-clavicular fossa, keeping thumb under the inferior pole of the sphere and the other fingers in tension behind it. Like the previous discussed error, the corrective exercises will comprise throws of different objects using push as basic principle

Other possibilities:
- keeping the weight at the neck, athlete makes jumping steps backward on the right foot; the left foot is making the impetus movement together with the impulse, followed by the detachment and landing;
- pendulum pushing exercises, starting on the spot or by stepping or jumping: the pendulum must be handed from the shoulder level, otherwise muscular tension and torsion are created. This exercise develops very well the sense of acceleration in the throwing motion.
- exercises borrowed from weightlifting: using the clean style and jerk breast style.
- clean and jerk breast style( from the chest) and releasing of the object, using a light barbell or an empty bar;
- squats with medicine ball, then throwing from the chest with two hands (athlete throws toward the wall a heavy medicine ball);
- variation of the above exercise: starting from lunge position (right foot backward) and extending feet.
- throwing the weight on site and with breadth (take-off) but not using the arm; the shot putter must transmit all the energy to the weight using only lower body movement, which must act the first in every attempt.
- throwing the weight on site.

Mistake 3: the hips move backwards during the final effort.

Causes/Effect: blocking foot is placed on the same line with the impulse foot and with the toes directed toward the target (fig. 1) and the right foot and hip does not realize a strong extension and pivot. The beginners commit frequently this mistake, trying to avoid getting out of the circle, but the length of the throw is sacrificed.

The left foot pushes backward and simultaneously blocks the hips rotation; the impulse is not powerful enough to raise the trunk over the blockage, so the hips move backward while the weight is pushed forward. The launching angle is diminished with significant values and also the intensity of the resultant force, thus the initial releasing speed of the object is reduced.
Correction: series of simulated throw using different objects from various positions, emphasizing the impulsion phase and its coordinated action in the lower body segments.

Other methods:
- the simulation of breadth without the final effort (following the correct feet position scheme);
- the simulation of the full breadth, the coach intervening to correct the final position of the left foot using an elastic cord tied on the left thigh of the athlete;
- the simulation of throw emphasizing the impulse on feet and on hips rotation.

Mistake 4: the trunk is bent on the left side.
Causes/Effect: the athlete tries to compensate the lack of strength by lowering the left shoulder to create muscular tension on the right side. There is no extension or resistance of the left foot or left side during the throwing (there is no blocking action).

The suppression of the rotation of the right side around the left side of the trunk which stops the occurrence of the centrifugal force and the amortization of the inertia due to the giving up, leads to a meager composing of low intensity forces which will determine a low speed of the weight releasing. In this way, an inexperienced shot putter could consider that he made a good throw because he had "felt" the strong action of the arm.

Correction: Exercises which request the pushing up of the left foot and the blocking of the arm on the same side at the end of the throw must be used.
Other possibilities:
- simulating the throw effort with the bar of the barbell on the shoulders;
- starting from the throw position on the spot but with the left foot raised, then put it down and execute the throw by emphasizing the final impulse;
- moving backwards by jumps followed by landing and practicing the movement of impulsion and feet rotation (without turning the body, one should keep the line of shoulders perpendicular on the throwing direction;

Mistake 5: launching the weight over the head (the body is disposed in profile related to the throwing direction).
Causes/Effect: after the jump, the athlete lands on the side to the throw direction and in high position, with the right foot demi-stretched and the left foot on the line. The hip is not working without the energetic action of the legs and the body is not turned toward the sector. The effect is an uncomfortable throw with great expense of energy, in relation to the force that the athlete manages to transmit to the object.

Correction: landing coordination exercises while making the movements specific to the final effort.
Other methods:
- standing with feet apart and executing squats after rising on toes and turning 90 degree to the left;
- raise the left arm laterally and pivoting on the right foot (the other segments do not participate to the movement).

Mistake 6: the release of the weight is done too low.
Causes/Effect: the athlete does not extend feet completely during the final effort and startsthe
phase of acceleration while keeping the elbow of the throwing arm under the level of shoulders; also the right hand is oriented too low toward horizontal level instead of the optimal position.

The effect of a low trajectory: such a deformation of the throwing trajectory reduces considerably its length. The height of the releasing object does not reach the maximum value of the capabilities of the shot putter (this advantage is offered by the pushing-throwing technique).

Correction: the height of trajectory must be obtained through the energetic impulse of feet and by raising the eyes rather than by adjustment of the arm action angle.

Other methods:
- simulate the throw on site or after a little jump, while keeping the hands on the hips; in this manner the athlete is obliged to use the lower body. This represents also a very good exercise to develop the dynamic balance.
- throwing exercise over a bar heightened to the level which obliges the athlete to rise on the toes, lifting chest and eyes;
- throws starting from a very low position.

3. Conclusions

The following exercises are merely given as a guide, referring to most common situations and representing only partially the solution of the problems. The coach must adapt his teaching style and methods or, where is appropriate, invent new methods that fit better the given situation and the features of the athlete. It is strongly recommended that all exercises should be performed on the less skillful side also.

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