CORRECTING METHODS FOR FREQUENT MISTAKES IN SHOT PUTTER TECHNIQUE

Corina IVAN[1]
Răzvan CIOBANU[2]

Abstract
The present paper is a theoretical study based [up]on practical experience of coaches having a track record of medals and titles. The purpose of the material is to help the young teachers that can meet some difficulties at the beginning of the shotput coaching career. The technique of the shotput is so complex that it needs permanent adjustments, even more since modifying the angle of action or the lack of involvement of a single segment, could have negative consequences on the length of the throw. The paper is referring to those disorders of the action mechanisms upon the implement that alters the result of attempt and needs special methods and exercises to correct these mistakes. The research is based on the presumption that the training of our shot putters is too much based on sensations produced by the throws without take-off and using the strength, detrimental to the efficiency of the technical gesture. The recommended methods are only optional.

Keywords: *track and field, shot put, technique, mistakes, exercices*

JEL classification: *I20; I25*

1. Introduction

The **motor** skills are extremely important to trigger performance in athletics; however, the balance tends towards the flawless mastering of the technique. The literature excels in describing the perfect technique, but is deficient in showing how to obtain it; thus, our paper could give brief instructions for specific situations on difficulties to acquire the correct throwing technique. We consider this material perfectly appropriated for a young coach at the beginning of his career when he might experience some uncertainty due to the gap between theoretical studies and practical work.

In order to reach the set goal, we have established and achieved the following targets: revealing the frequently occurred mistakes and their causes in shot putter's execution, finding the appropriate methods to prevent and correct them and recommending the best remedial solutions.

[1] UNEFS, corinaivan.javelin@yahoo.com
[2] UNEFS, ciobanurazvanionut@yahoo.com

The following exercises are merely given as a guide, referring to most common situations and representing only partially the solution of the posible problems. The coach should 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 both: on the thrower arm or body side and on the less skillful side also.

2. The issues addressed

In the momentum building phase, the athlete and implement move together as one unit to achieve 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 throwing 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 implement, all three conditions being at the origin of other numerous mistakes.

Mistake 1: the athlete does not push the shot put with the fingers (he/she does not complete the throw).

Cause/Effect: the shot put is in contact with the palm of the throwing 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 grip, then by practicing the specific thrusting action using combined throwing exercises with balls and weights of various size. These exercises focus on the pushing movement of the fingers.

Other exercises:

- pushups with palms in extension and rising on fingers, or explosive pushups;
- 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: due to the fact that the skill of pushing is less natural than throwing, the beginner is tempted to throw the shot put, 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 the decrease of the launching angle and reducing the releasing speed. Furthermore, this technique is not allowed by the competitive regulations and the throw will not be considered. Improper use of lever arms may cause the athlete to experience pain in the elbow and fingers after several throws due to the lack of support against the inertia of the weight.

Correction: the repetition of the correct manner to hold the shot put 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 pushing as basic technique principle.

Other possibilities:
- keeping the shot put 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 tackoff and landing;
- pendulum[3] 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, jerk style and releasing of the implement, 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.
- throw on site with momentum but not using the arm; the shot putter must

[3] Pendulum is a rope hanging from the ceiling, with a big knot at extremity

transmit all the energy to the shot using only lower body movement, which must act the first in every attempt.
- throw on site.

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

Causes/Effect: blocking foot placed on the same line with the impulse foot and with the toes directed toward the target (fig. 1[4]) 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 release angle is diminished with significant values and also the intensity of the resultant force, thus the initial releasing speed of the object is reduced.

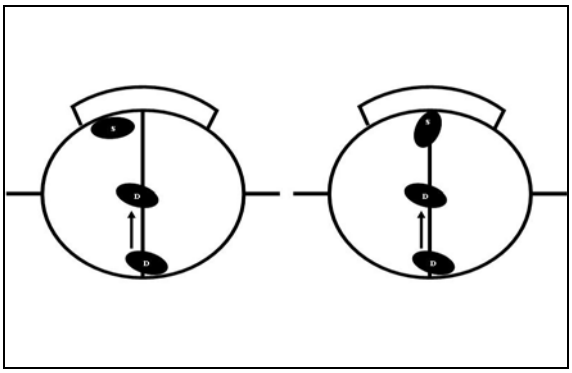

Figure 1: Position of the feet before the final effort

Correction: series of simulated throws 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

[2] Left = correct; Right = wrong

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: releasing the shot put 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 implement.

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 implement is done too low.

Causes/Effect: the athlete does not extend feet completely during the final effort and starts the end 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 release height 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.

Mistake 7: balancing of the left foot.

Causes/Effect: the athlete balances his left foot from rear to front and executes the momentum by rising high the foot. He is incorrectly based on the balancing amplitude to foster the movement in the center of the circle and does not push explosively on the right foot. The displacement is not "slipped" but the athlete instead jumps too high.

Correction: the left foot must be pushed backward and downward and both legs must pass grass cutting over the circle surface. The correction of this mistake is made by performing series of slipped displacements like the impetus movement, but more diversified. The emphasis will be put on the correct feet displacement.

Other methods:

- backward long jump on the spot, starting on one or both feet;
- backward jumps on one foot; it must keep toes inward and trunk is hunched forward (demi-squat position), keeping the right hand at the neck and the left hand toward the front, like the impetus position. The exercise must be practiced on both sides.
- backward displacement departing from demi-squat starting impetus position: the left foot makes a backward step grass cutting followed by pulling the right foot in a slipping motion over the floor;
- the same exercise as above but making jumps instead;
- a variant of the above exercise: executing the left foot step or balancing it for jump, followed by the kicking of a ball with the heel;
- all above exercises will be executed on both sides.

Mistake 8: too high jump.

Causes/Effect: the athlete executes the momentum movement and the takeoff under an angle greater than 30°, instead of taking a low, parallel to the ground, jumping step and a slip on the surface of the circle. Right foot pushes in an ascending movement. A high glide leads to loss of speed and an inherent delay in the touchdown of the left foot, with significant repercussions on balance.

Correction: is done using backward displacements, with or without shot put, emphasizing the action of pushing, landing and displacing of feet during the fly.

Other methods:

- all the methods recommended in the previous situations could be used in this case;
- raising the start place with 10 cm; jumping and landing on the ground; executing simulations without the final effort or throws.

Mistake 9: landing in high position.

Causes/Effect: after jump, the athlete lands in standing position; the body weight is not distributed on the right foot, but equally on both feet. The upper body is heightened at the beginning or during the slipped displacement.

Most of the energy received by the object comes from the lower half of the body. Defective coordination will limit movement of the feet.

Correction: exercising many repetitions of the backward jumping displacements and of throws to the wall starting from demi-curled position, keeping the back on the throwing direction.

Other methods:

- simulating the jump: the coach is situated in the posterior part of the circle and holds the hand of the shot putter to determine him to land in demi-curled position with the back in the direction of the throwing and having the weight on the right foot;
- displacements backward on the direction of the throwing, with raised and united hands, head and trunk slightly bent; jumps and landings in low position (from here it could execute a torsion movement).

Mistake 10: Feet position does not exceed the upper body projection.

Causes/Effect: the right foot is not pulled under the body after the jump; the projection of the mass center should fall at the posterior limit of the circle support.

The widening of the support base and the fact that the lower body does not advance too much affects the composing mechanism of forces; the feet and the hips have less space for action and the movement of the shoulder and arm becomes more active than reactive.

Correction: simulations and exercises which require the overcoming by jumping of certain obstacles or markers must be used.

Other methods:

- one foot jumping;
- combinations of jumps and multi-jumps: L-L-R-R, R-R-L-L, L-R-R-L-R-R,
- R-L-L-R-L-L, R-L-R-R-L-R-L-L-R, and so on; these exercises will be performed also backwards;
- jumping over the marker placed at 20 cm from the center of the circle, in the anterior part; simulations or throws could be performed in this manner;
- standing position with the back toward the throwing direction, keeping the medicine ball at the chest, the athlete makes a big step with the left foot, pulls the right leg and throws (pushes) the ball onto the mattress on the wall.

Mistake 11: the left foot lands with the toes to the rear, on the sole or on the heel and in a high position of the body.

Causes/Effect: lack of coordination at the level of the ankle; lack of focus; the whole mechanism of movement is not well learned. The contact with the ground in any of these forms, causes the relaxation of the thigh musculature, which implies a less strength transposed in the throw.

Correction: by exercising the contact with the ground and the impulsion.

Other methods:

- jumps with extended knees on one or both legs on grass, concrete or sand.
- any form of backward- jumping displacement.

Mistake 12: the placement of the blocking foot too laterally.

Causes/ Effect: the left foot touches the ground too late, while the right foot and hip together with head and shoulders already effectuates the rotation movement which is triggered too early during the flying phase.

"The great acceleration" begins in the moment of the double support; shortening the acceleration period involves the decreasing of weight releasing speed. The deviation from linear trajectory of the take-off decomposes the action forces, having also negative repercussions on the initial speed.

Correction: the position of segments during the take-off must be correct; the athlete did not assimilate, most probably, all the phases of the procedure, a hard repetitive simulation and various throws being necessary (from different start positions). It could be offered to athlete indications as such: "The look must be directed to the rear of the circle during the take-off" or "Keep left arm semi-extended backward (to stay closed) until the final effort."

Other methods:

- the coach could control the landing place of the left foot using an elastic cord tied on the thigh of the athlete during the simulation of the impetus, pulling it from the right side of the circle;
- simulations of the momentum made over the markers indicating the right position of feet;
- throwing of the medicine ball to the wall with two hands from the chest using the stepping procedure.

Mistake 13: the athlete does not transfer the weight from one foot to the other.

Causes/Effect: the athlete put his weight on the rear foot until the end of the throwing, neither managing to extend it completely nor bringing hips on the throwing direction. The mistake reduces the height of the release and the initial speed of the object.

Correction: a whole range of throws especially with medicine balls could be used to avoid and correct this error by the building the impulsion sense from up to down and from the rear to the front, involving the whole body in throwing.

Other methods:

- throws starting from the initial position and staying laterally to the throwing direction, at a distance of two shoulder widths; the flexion of knees (up to 90 degree), passing the weight on the front foot, then on the rear foot followed by extension and a quick twist and throw;

Mistake 14: the action of the arm begins before of the lower body.

Causes/Effect: the shot putter hastens to finish the throwing; desiring to imprint a greater speed to the implement, he damages the synchronization and the correct succession of the muscular chains action.

The effect of this action is far from the expected because it reduces the force applied to the object and decreases the speed of releasing it.

Correction: the athlete must be aware of the importance of the lower body and of the movement succession in throwing, therefore such exercises are recommended. They suppose executions with or without object, but in the first case, it should be thrown without using the arms.

Other methods:

- simulations of the take-off, isolating first the movements (as separate executions, explained by the coach) then continuously, from end to end;
- throws on the spot without the arm action (the athlete must push the weight only by the feet and trunk action, minimizing the arm action).
- throws with take-off, without the arm action.

Mistake 15: the release of the object is performed with the palm facing down;

Causes/Effect: such throwing is rather like a basketball disposal and is produced when the angle between trunk and throwing arm decreases under the optimal value ("the athlete keeps down the elbow").

Consequently, the arm extensors are no longer tense before their starting action, thus a force reduction and implicitly a diminished throwing length results.

Correction: could be done by exercising the pushing and releasing of the weight exercises; passing the weight from one hand into another (alternates the tensing and the relaxing musculature at the hands level).

Other methods:

- pushups with palms inwardly oriented; simple, with detachment or with

uplift on certain implements;
- passing the weight from one hand into another at the level of the chest, knees or over the head, around the waist or among feet;
- pushing the shot from the chest level into the ground;
- vertical throws with one arm;
- throws of the weight or of the medicine ball to the wall from standing with feet apart and parallel and looking at the throwing direction.

Mistake 16: too rapid change of feet position.

Causes/Effect: the athlete performs the change before releasing the weight. He fears to make an incorrect thrust, to exceed the limits of the circle and therefore he performs the change of feet at the transfer of weight on the blocking foot should be actually performed. The effect appears so as an unfinished throwing. The levers cannot act upon the implement without a base support and the mechanical work disappears.

Correction: executing low intensity throws; the athlete must remain on double support after releasing the weight, then the intensity could increase, but following the same request. The athlete will effectuate the change of feet position at the right time, due to of the natural delay that appears.

Other methods:
- throws of the medicine ball to the wall from the chest with two hands; starting from lunge, throwing and changing the feet.
- use of a heavy medicine ball to compel the shot putter to extend the throwing effort to maximum, including the double support phase.

Mistake 17: the right foot does not act immediately after contact with the ground.

Causes/Effect: the athlete focuses more on the upper body action and does not give the needed attention to the feet action. This delay leads to decrease the forward force accumulated by the jump and by the muscular tension at the thigh level.

Correction: is made by jumping, multi-jumps or other forms of jumping used for tensioning of the muscles before throwing.

Other methods:
- standing long jump, landing and throwing of medicine ball with two hands from the chest.
- jump from a taller object (the gymnastics chest e.g.) landing on both feet and throwing of medicine ball with two hands from the chest.
- jump from standing into lunge and throwing of the implement (using a

lighter weight or a medicine ball).
- shot put with side steps.
- 180° turn, jump landing in a lunge position, and shot put throwing.
- gliding shot put, focusing on the quick reaction time of the right leg.

3. Conclusions

Two corrective exercises are constantly present among the others described, being remarked as solutions for most of the issues: it is about the simulation of the momentum and throw using different objects. The simulations executed with the contest weight, with or without using substituent objects, are always present in shot putters' training. They are used by coaches as theaching means in the prior learning, both in the perfection stage and for correction also, having the advantage to offer a great number of repetitions in relatively short time.

Other, but long-term solutions to avoid and correct the mistakes are found in static and dynamic balance development, in the sense of spatial orientation and in ambidextrous training. Nowadays, increasingly more coaches use the gym for training. Although it seems paradoxical, the formation of shot putters is mostly based, among all other athletic events, on multilateral and fine inter-segment and intra-muscular coordination. This is perfectly understandable, judging upon the fact that they are handling objects.

REFERENCES

1. Ciobanu, R., 2013. *Studiu privind mijloacele folosite pentru corectarea greşelilor frecvente de tehnică la atleţii aruncători.* Lucrare de licenţă. UNEFS, Bucureşti
2. Carr, G., 2003. *Atletism – aruncări (aperiodice – vol. 2).* Institutul Naţional de Cercetare pentru Sport, Bucureşti
3. Gygax, P., 1992. *Atletismul în şcoală – vol. III Aruncări*. Traducere Laura Marinca, Centrul de Cercetare pentru Problemele Sportului, Bucureşti
4. Ivan, C., 2011. *Atletism – Metodica antrenamentului la copii şi juniori mici – curs pentru studenţii anului III – ediţie revizuită şi actualizată*, UNEFS, Bucureşti
5. Rogers, L. J., 2004. *Manualul antrenorului de atletism din SUA*, Institutul Naţional de Cercetare pentru Sport, Bucureşti