AN ANALYSIS OF SANDY KOUFAX'S PITCHING MOTION & MECHANICS

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The Riddle of Sandy Koufax

- I don't know how to classify him.
  - Part of me really likes what he does.

    He is a Hall of Famer and has six amazing seasons.
  - The other part of me gets scared off by his injuries.

    His career was cut short by serious injury problems.
- He does appear to have had some sort of congenital circulatory problem, which may have made him especially fragile.
- He was also pretty badly abused as a pitcher.
  - Pitched a large number of innings.
  - Many of the treatments that he received compromised his body's ability to recover from injuries.

General Comments About Sandy Koufax

- 6' 2"
- 210 lbs
- Pitches...
  - Fastball (Primary Pitch)
  - Curveball (Primary Pitch)
  - Forkball
  - Change-Up
- Hall of Famer
- Had 6 mediocre seasons and 6 spectacular seasons.
  - Catcher convinced him to not throw as hard and to mix curveballs and change-ups in with his overpowering fastball.
- Retired due to elbow problems.
  - Sometimes referred to as "traumatic arthritis".
  - Possibly related to congenital circulatory problem.

    Reduction in blood flow could have hindered the healing of the bones and cartilage in his elbow.
  - Sometimes threw as many as 150 pitches in a game.

Comments About Sandy Koufax's Pitching Motion And Mechanics

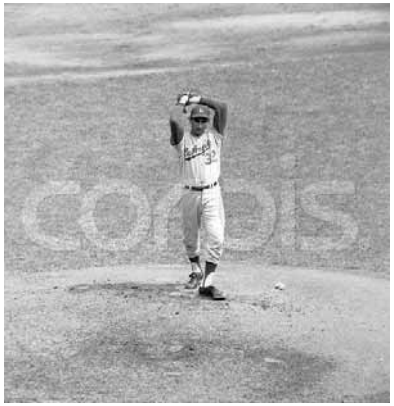
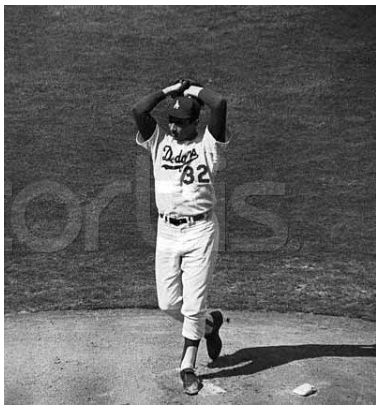
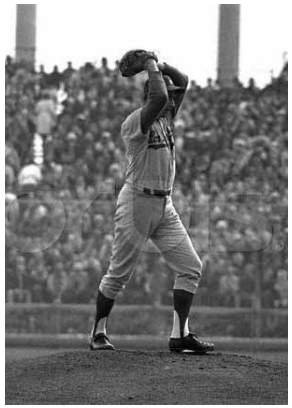
- Eyes always on the target.
- Nice long, circular arm path.
  - High and wide leg kick gives him extra time to get his arm up and ready to go forward.
  - Keeps the pitching-arm-side shoulder below the glove-side shoulder until just before he is ready to start rotating.
- Modified Lunge-Style pitcher.
  - Landed with glove-side knee bent 120-150 degrees.
  - I say "Modified Lunge-Style" because it looks like he straightened his glove-side leg as he was about to release the ball (e.g. pushed back toward 2B).

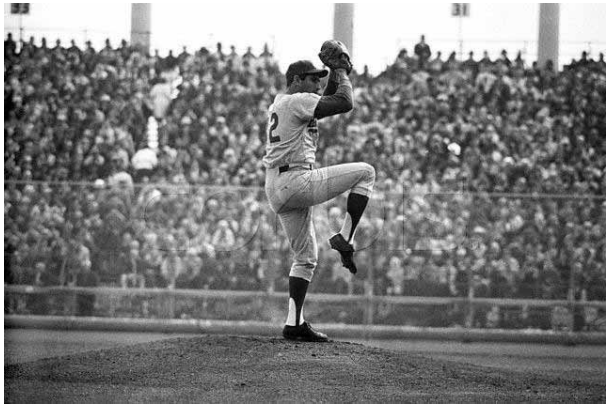
    This would increase the degree to which his hips rotated which would increase the amount with which his shoulders rotated and likely helps to explain his high velocity.

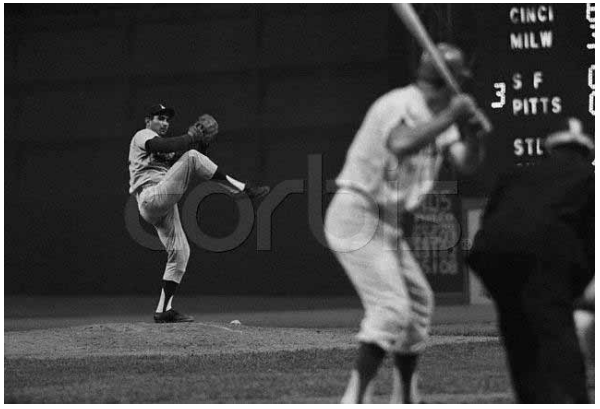
    Nolan Ryan did something similar, but not to nearly the same degree.

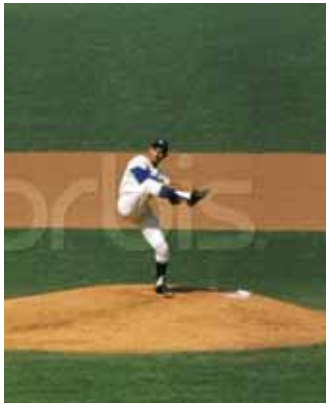
    Bobby Jenks does this to the same degree...
    - Also a very hard thrower.
    - Has also had continual elbow problems.

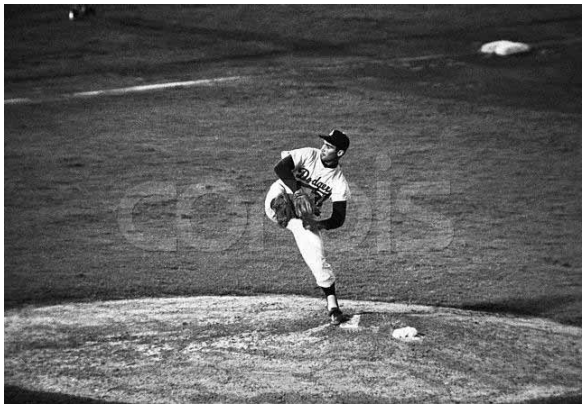
    With respect to the possible injury risk of stiffening up the glove-side leg, the difference may be betwen stiffening up (possibly OK) and pushing back with (possibly bad) the glove-side leg. It may also be related to when the pitcher does it. You can see Koufax's knee stiffen between frames 21.1 and 22.1. Koufax also stiffens his glove-side knee sooner than does Clemens.
    - What I'm talking about isn't stiffening the leg (while still preserving some degree of flexibility). What I'm talking about is locking the knee. This may keep the leg from absorbing some of the shock and the force of the deceleration and may instead transfer it somewhere else up the kinetic chain.
- Very late rotator.
  - Does not rotate until after glove-side foot is planted.
- Very nice glove-arm action.
  - Probably contributed to his velocity.
- Pronates the forearm after releasing the ball.
- Did <u>not</u> show the ball to Center Field.

1. 1  2  3  4  5 

2. 1  2 

3. 1  2  3 

4. 1  2 

5. 1  2 

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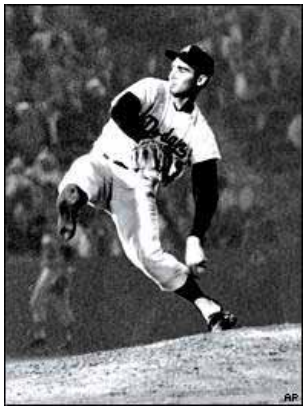
7. 1  2 

8. 1  2 

9. 1 

10. 1 
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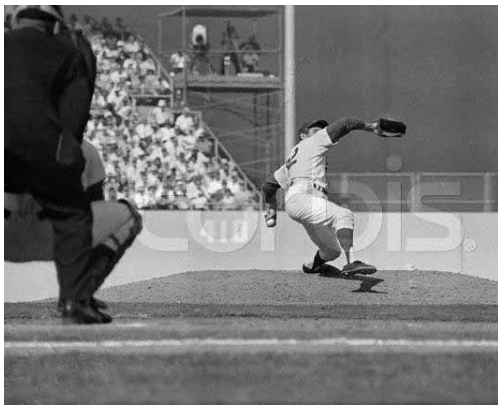
2 
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12. 1 
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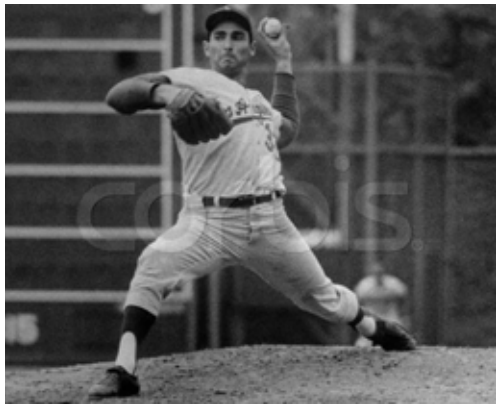
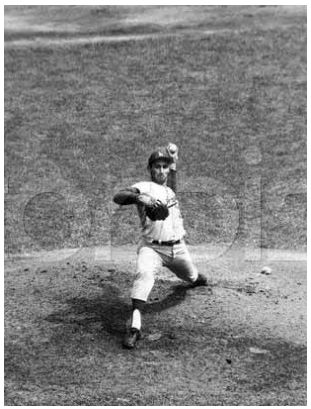
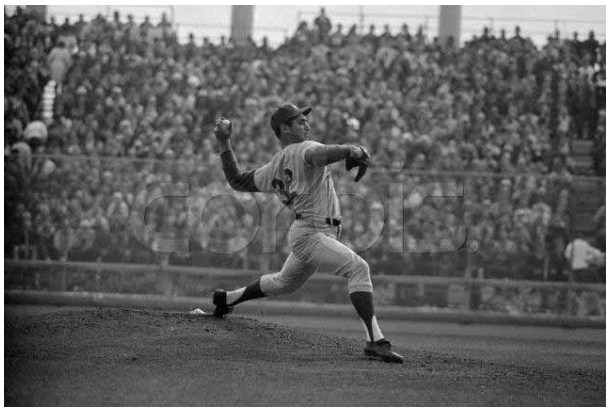
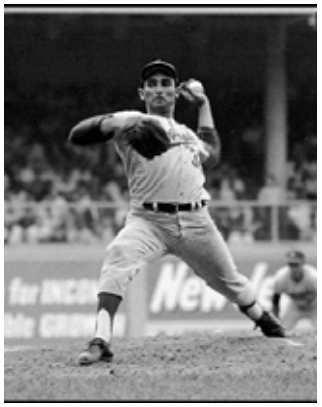
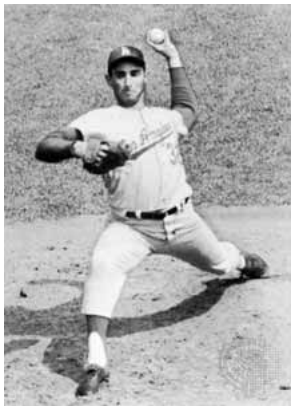
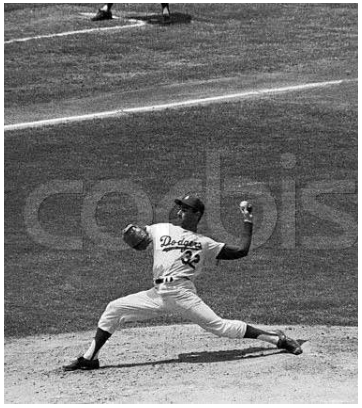
For reasons that I don't understand, some people are adamant in saying that the ball should be facing CF when the pitcher is ready to go to the plate. The problem is that this can lead to elbow and shoulder problems. Notice that in frames 10.1 and 11.1, Koufax's palm is facing 1B rather than CF.

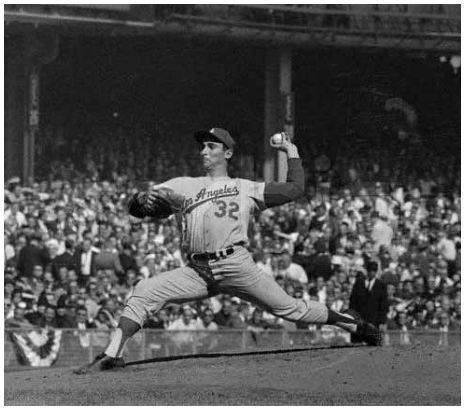
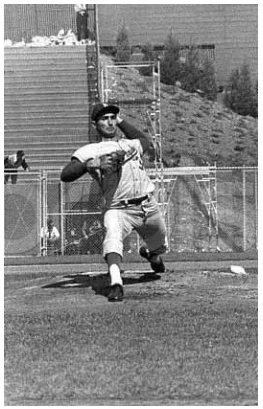
13. 1  2  3  4 

In the above pictures, Koufax's glove-side foot is planted on the ground with his knee bent between 90 and 100 degrees. From this point, in order to keep rotating his hips, Koufax will push back toward 2B with his glove-side leg, which will result in his glove-side leg being nearly straight at the moment that he releases the ball. This will give him an extra boost of power because it will pre-stretch the muscles of his torso, enabling them to rotate his shoulders faster than they otherwise could. This may explain Koufax's exceptional velocity. The question is whether Koufax's pushing back on his glove-side leg introduced a whipping action that his (possibly congenitally limited) arm could not withstand.

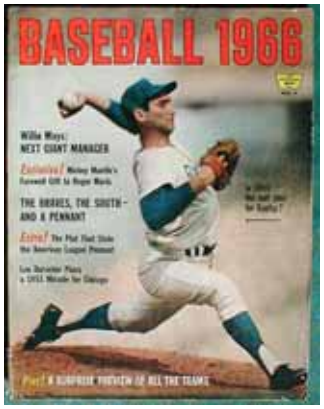
14. 1 

15. 1  2  3  4  5 

Now that his glove-side foot is firmly planted on the ground, he has just started to rotate his shoulders (notice that the inertia of the ball in the hand has caused his wrist to bend backward as the forearm starts to come around). You can also see that Koufax has started to straighten his glove-side leg so as to keep rotating his hips and to stretch the muscles of his torso to their maximum extent so that they can produce the maximum force.

16. 1  2  3  4 

His pitching forearm is bouncing back behind his head because he had his elbow 90 degrees from his upper arm at the moment that he started rotating his shoulders.

17. 1  2 

Based on a close analysis of picture 17.2, it appears that Koufax had a non-traditional curveball grip. He appears to have put his middle finger on a seam and raised his index finger up and off the ball (in a way that resembles a knuckleball). This non-traditional grip, combined with his near-vertical forearm at the Release Point, may explain why his curveball was so effective.

18. 1  2  3 

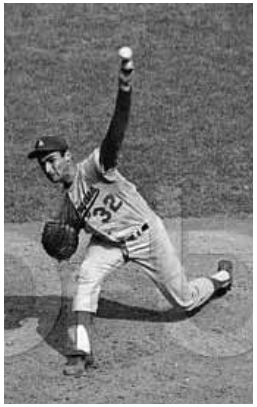
Based on the position of his wrist and palm (the palm is facing 3B), in frame 18.1 I would say that Koufax is preparing to throw a curveball. In contrast, in pitctures 18.2 and 18.3, Koufax's palm is facing upward in what looks like a fastball grip.

19. 1 

Based on the position of his wrist and palm (the palm is facing upward) in frame 19.1, I would say that Koufax is preparing to throw a fastball.

20. 1 

Based on the fact that you cannot see the ball in this frame, I would say that in frame 20.1 Koufax is preparing to throw a curveball.

21. 1 

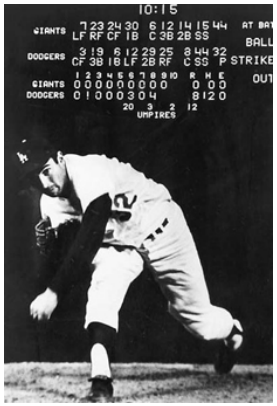
22. 1  2 

RELEASE POINT: Koufax had excellent glove arm action, which likely contributed to his velocity. He pulled the glove into his upper chest and kept his elbow up and away from his body. This would help to maximize the rotation of his shoulders. It also left him in a decent fielding position, with his glove fairly close to his face and ready to come up in case of a come-backer. Also, notice that at the point that he is releasing the ball, his glove-side knee has almost straightened.

23. 1  2 

24. 1  2  3  4 

Notice that in picture 24.1 he is pronating his forearm after releasing the baseball.

25. 1 

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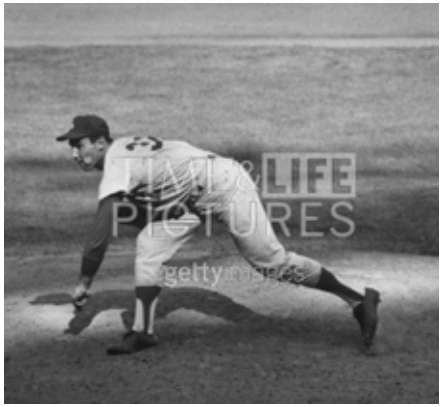
3 

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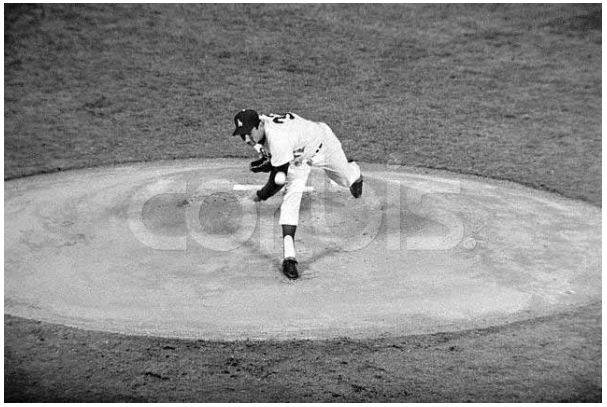
27. 1 
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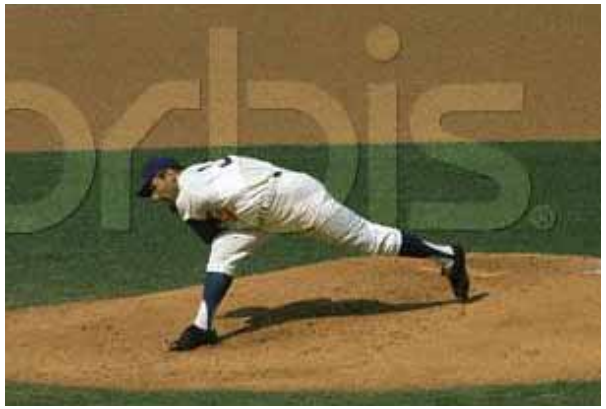
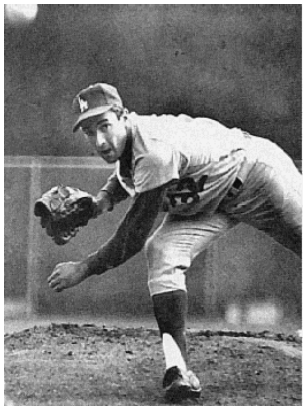
28. 1 

29. 1 

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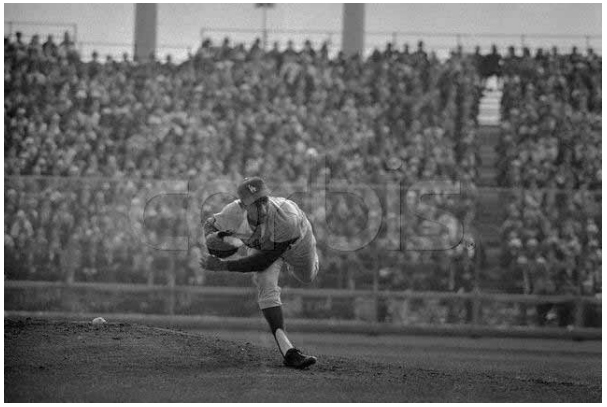
3 

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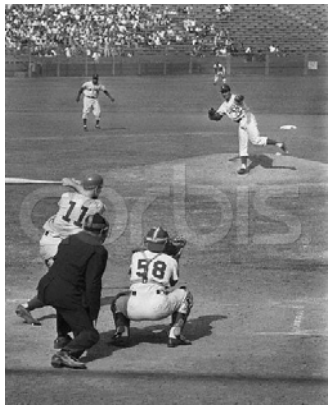
2 

33. 1 

Finishes in a good fielding position.