News

Telemetry system BioRowTel v.4 was successfully used during FISA women's' development camp in Seville on 11-13 February. 24 athletes from Sweden, Norway, Estonia, South Africa, Egypt, Pakistan and Puerto-Rico were tested in doubles and pairs and received information about the main characteristics of their rowing technique.

Ideas

The idea came from looking at the photo below found in Rowing Voice N5, thanks to Chris Dodd and Rob Bristow (http://www.total.rowing.org.uk/voice/voice5-i.pdf):
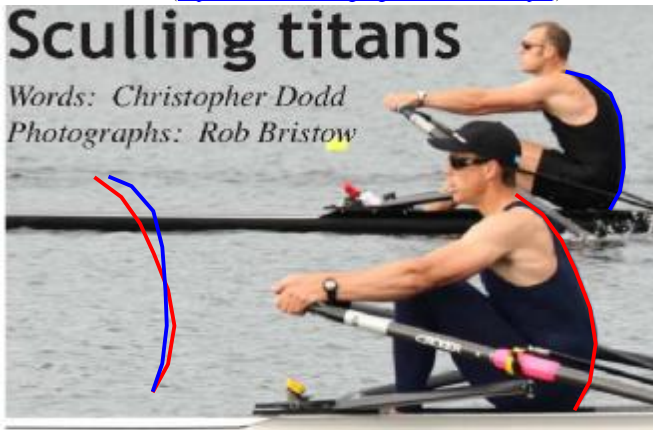
We can see how different the contours of the back in these two great scullers (Rob Waddell in the foreground and Mahe Drysdale in the background). When we draw the contour lines, scale and overlap them, the difference is obvious: Mahe has a straighter lower back and more curvature in the chest, where as Rob has the opposite.

Then we compared the back curvatures of five of the best World single scullers (see images in the Appendix) at the catch, the middle of the drive (near perpendicular position of the blade) and the finish. The diagram below shows the overlapped curves scaled with preserved aspect ratio:
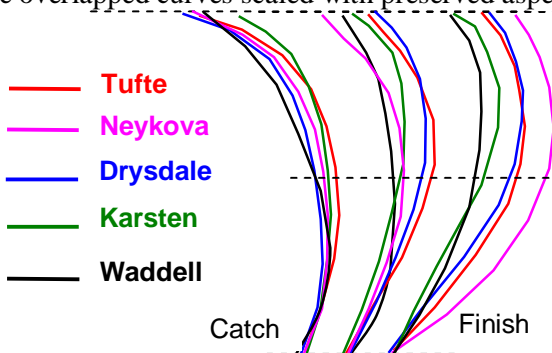
You can see that Wadell's back curves are definitely outstanding: it has more curvature in the lumbar area (especially at catch) and less curvature in the thoracic area in all positions. To get some numbers we conducted a very simple digitising of the back curvature, which was divided into four zones of the same height relative to the vertical Y axis. The coordinates of five points A, B, C, D and E were obtained at the locations, where the back curvature crosses the border of each zone. Lumbar angle **α** was determined between lines AB and BC; thoracic angle **β** was measured between lines CD and DE. Advantage of this method is that it

does not require markers on top of the centres of joints as the back curve can be clearly seen from the side.

Analysis of the lumbar and thoracic angles confirmed our qualitative observations: the four best scullers have significantly straighter lumbar angles (160-180 deg) and more curved thoracic angle (140-160deg), while Waddell had a more acute-angled lumbar area (150-160deg) and a straighter thoracic angle (160-170deg).
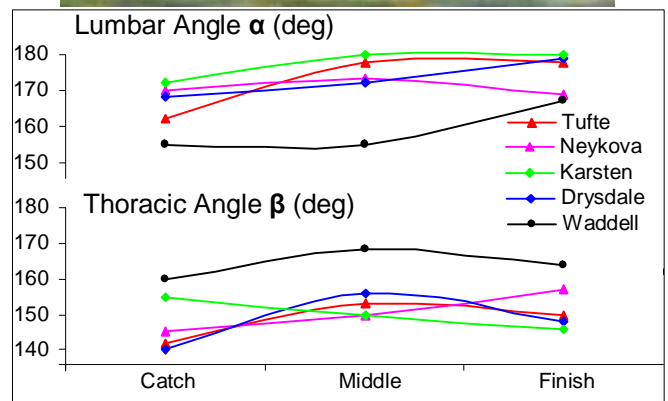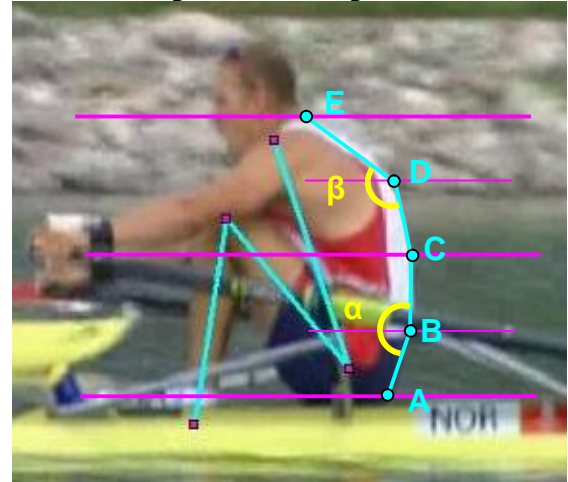
The hypothesis is the following: a straighter lumbar area can help to transfer the force better from hips to shoulders and prevent injuries, but **more curvature in the thoracic area can be more economical because it uses more elastic properties of the muscles rather then its strength**. The first part of the hypothesis is well known and many coaches emphasise straighter lumbar posture with pelvis rotation around hips in conjunction with trunk (RBN 2005/07). However, the second part has not been widely discussed to our knowledge. Contrarily, a feature of some rowing styles is a straight thoracic back, which can be observed on published posters of rowing technique.

The reasons of more thoracic curvature in top World scullers are not clear yet. It can be related to adaptation to many years of high load as it is more noticeable in experienced scullers. Alternatively, it can be a natural selection of athletes with a specific posture, which allow them to spend less energy in sculling and, therefore, be more successful. More research needed in this area.

Contact Us:

* *©2009: Dr. Valery Kleshnev,*
kleval@btinternet.com , www.biorow.com

M1x NOR Olaf Tufte, Two times Olympic champion of Athens-2004 and Beijing-2008

W1x BUL Rumyana Neykova, Olympic champion of Beijing-2008

M1x NZL Mahe Drysdale, Four times World Champion 2005-7, 2009

W1x BLR Ekaterina Karsten, Two times Olympic champion of Atlanta-1996 and Sydney-2000

M1x NZL Rob Waddell, Olympic champion of Sydney-2000