

CREATIVE CONCEPTS

Attempts to prevent “tongue swallowing” may well be the main obstacle for successful bystander resuscitation of athletes with cardiac arrest

Dana Viskin, B Med Sc,* Raphael Rosso, MD,* Ofer Havakuk, MD,[†] Lior Yankelson, MD, PhD,[‡] Sami Viskin, MD*

From the *Tel Aviv Sourasky Medical Center and Sackler School of Medicine, Tel Aviv University, Tel Aviv, Israel, [†]Keck School of Medicine, University of Southern California, Los Angeles, California, and [‡]NYU Langone Medical Center, NYU School of Medicine, New York, New York.

Death and life are in the power of the tongue.

Proverbs 18:21

On March 3, 1990, Hank Gathers collapsed with cardiac arrest in the middle of a National Collegiate Athletic Association Division I basketball game and passed away. His death stirred extensive discussions as to the cause of his death and the possibility of preventing it. The ensuing litigation process was closely followed by articles in leading medical journals, which also focused on the ethical aspects of medical screening of athletes.¹ These questions notwithstanding, the sequence of the events taking place during that basketball game, as caught on television, shows another way that could have prevented this tragic death: A 2:41-minute video accessible on YouTube² clearly shows the bewildering and undisputable fact that for 2 entire minutes after his collapse, Hank Gathers received no form of cardiopulmonary resuscitation (CPR).

In the present study, we propose that grossly inadequate responses by fellow team members *may well be* an unappreciated serious obstacle to successful resuscitation of athletes collapsing with cardiac arrest during competition. Furthermore, we suggest that the main obstacle to an appropriate bystander response during athletes' cardiac arrest could be an apparently widespread false myth: that “tongue swallowing” is a common complication of sudden loss of consciousness (LOC) that must be avoided or relieved at all costs to prevent death from asphyxia.

Methods

We searched the Internet for posted events of cardiac arrest (or events of transient LOC if the latter prompted any form of resuscitation) that were caught on video or were described

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Address reprint requests and correspondence: Dr Dana Viskin, Tel Aviv Medical Center, Weizman 6, Tel Aviv 64239, Israel. E-mail address: danaviskin@gmail.com.

in detail. Specifically, we searched Google, Google Images, Google Videos, and YouTube using the following keywords: *collapse, athlete, sudden cardiac event, sudden cardiac death, sudden death*, and “*commotio cordis*.” We repeated this search in each of the following languages: English, Spanish, French, Russian, Arabic, Portuguese, German, and Hebrew. From each video found, we also searched for “similar videos” in both Google and YouTube. Each video was analyzed for the following data: (1) demographic data of the person with cardiac arrest (sex, country of origin, type of sport, type of activity [training or competition]); (2) country date of the event; and (3) rescue process, including a detailed analysis of the sequence of events from the moment of collapse through the entire rescue procedure. We recorded the time that passed from the moment of collapse until each of the following events: (1) the first team member arrives, (2) medical aid arrives, (3) the first rescue maneuver is performed, (4) performance of chest compressions; (5) automated external defibrillator (AED) advent to the scene, and (6) the first AED shock is administered. When the video terminated before any of the events took place, we recorded the specific time as “at least” the duration of the video. We focused in particular on what did the first witness do, before or after calling for help. We also looked at the professional medical team's response and checked them according to the algorithm of field sudden cardiac arrest management (published in 2010)³ and the Fédération Internationale de Football Association (FIFA) consensus statement regarding the treatment of cardiac arrest on field (published in 2013).⁴ Finally, for each case we also looked up relevant news articles published on the Internet to examine the way the media referred to each case.

Results

We found 29 videos,^{2,5–32} recorded in different countries between 1990 and 2017, showing athletes collapsing with cardiac arrest (n = 23) or LOC (n = 6). The LOC cases were included because they were long enough and dramatic enough to prompt resuscitation maneuvers, albeit without

Table 1 Events of cardiac arrest of athletes (or LOC prompting rescue maneuvers) that were caught on video and are available for review on the Internet

Survival	Type	Chest compression (time to onset)	First maneuver preformed	Country* (year)	Sport/type	Sex/age (y)/country of origin*	No. of athletes
No	CA	No	Player is held down, with convulsive movements apparent	United States (1990)	Basketball/C	M/23 ² /United States	1
Yes	CA	No	Neck stabilization	United States (1998)	Ice hockey/C	M/24 ⁷ /Canada	2
Yes	CA	No	Airway control and intubation before chest compression. Delayed defibrillation. Attempts to prevent tongue swallowing	Israel (2002)	Soccer/C	M/22 ⁶ /Israel	3
No	CA	No	Head tilt and then airway opening. Attempts to prevent tongue swallowing	France (2003)	Soccer/C	M/28 ⁸ /Cameroon	4
No	CA	Yes (2:37 min [†])	Player placed on his side and airway secured. Attempts to prevent tongue swallowing	Portugal (2004)	Soccer/C	M/24 ⁹ /Hungary	5
No	CA	Yes (30 s)	A fan is waved. Player is left lying down. First maneuver by medical aid is an attempt to prevent tongue swallowing	Brazil (2004)	Soccer/C	M/30 ¹⁰ /Brazil	6
No	CA	No	Head lifted, airway opened, players lift their shirts and wave them. Attempts to prevent tongue swallowing	India (2004)	Soccer/C	M/24 ¹¹ /Brazil	7
Yes	CA	Yes (46 s)	NA	United States (2005)	Ice Hockey/C	M/25 ¹² /Czech	8
Yes	LOC	No	Pupil check, blood pressure check, oxygen check	United States (2005)	Wrestling/C	M/38 ¹³ /Mexico	9
No	CA	No	Player is on his stomach, with mouth forced open and tongue held by several players. Attempts to prevent tongue swallowing	Spain (2007)	Soccer/C	M/22 ¹⁴ /Spain	10
Yes	CA	No	Player is placed on his side and given soft pats on his head. Attempts to prevent tongue swallowing	Spain (2008)	Soccer/C	M/23 ¹⁵ /Spain	11
No	CA	No	NA. Player is seen on the bench. No form of CPR is visible until he is removed from the scene	Russia (2008)	Ice hockey/C	M/19 ¹⁶ /Russia	12
NA	CA	No	Gently pats his face, clothes taken off, airway is checked. Attempts to prevent tongue swallowing	United Kingdom (2009)	Martial arts/C	M/NA ²⁰ /NA	13

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