

Author, year	Sex/age	Risk factors	Headache history	Location	Quality	Intensity	Nausea	Photophobia or phonophobia	Aggravated by exertion	Symptoms of cardiac ischemia	ECG	Cardiac enzyme	Stress test	Coronary angiogram	Treatment
Lefkowitz, 1982 <sup>7</sup>	M/62	NS	NS	Bregmatic	Explosive	Severe	NS	NS	Yes	Retrosternal pain, numbness both arms	Chronic anterolateral ischemia	NS	Headache and ST depression	Triple-vessel disease	CAB
Fleetcroft, 1985 <sup>8</sup>	F/78	NS	NS	Frontal to mouth	NS	NS	NS	NS	Yes	Chest pain radiating to both arms	ST elevation II, III, aVF	NS	NS	NS	Medical
Blacky, 1987 <sup>9</sup>	M/40	No	NS	Bitemporal	NS	NS	No	NS	Yes	None	NS	NS	Headache and inferolateral ST-segment depression	100% CXA, severe stenosis RCA	Medical
Vernay, 1989 <sup>10</sup>	M/71	Smoking	NS	Occipital, parietal and frontal	NS	NS	NS	NS	Yes	Shoulder numbness, substernal tightness	Q wave in III and chronic anteroapical ischemia	NS	Headache and ST depression	NS	Medical
Takayanagi, 1990 <sup>11</sup>	M/67	NS	NS	Occipital	NS	Severe	NS	NS	NS	Chest pressure	ST elevation/vent	NS	NS	NS	Death

											ricular fibrillation				
	F/64	CAD	NS	NS	NS	NS	NS	NS	NS	Chest pressure	ST elevation and Q waves in II, III	NS	NS	Triple- vessel disease (95% LAD, 99% RCA)	Death
Bowen, 1993 <sup>12</sup>	M/59	HT, obesity, HL, smoking	Yes	Bitemporal	NS	Severe	No	No	NS	Left arm and chest pressure	ST Depression in anterior leads	NS	NS	100% RCA, 95% CXA	PTCA
Ishida, 1996 <sup>13</sup>	M/64	Smoking	No	Occipital	Throbbing	Severe	Yes	NS	No	Bilateral shoulder pain	Q and inverted T waves in inferior leads	↑	Headache and ST- segment depression	Triple- vessel disease (99% RCA, 75% CXA)	PTCA
Grace, 1997 <sup>14</sup>	M/59	NS	No	Vertex and occipital	Bursting	Severe	NS	NS	Yes	No	T wave inversion in aterolateral leads	NS	Headache with ST depression	Subocclusion RCA, 70% LDA	CAB
Lipton, 1997 <sup>3</sup>	M/57	Past smoking	NS	Vertex	sharp	Severe	Yes	No	Yes	Chest discomfort	Flattened T waves in II, and aVL, an inverted T wave in V <sub>5</sub> , and biphasic T waves in III, V <sub>4</sub> and V <sub>6</sub>	NS	Headache and ST depression in leads II, III, aVF, and V <sub>4-6</sub>	Triple- vessel disease	CAB

	M/67	HT, past smoking	NS	Bifrontal	Pressing	Severe	No	No	Yes	No	Possible old inferior wall myocardial infarct	NS	Headache and inferolateral ST depression	Triple-vessel disease	PTCA
Lance, 1998 <sup>15</sup>	M/62	Smoking, HL	No	Right frontal	NS	NS	NS	NS	Yes	Chest tightness	NS	NS	Headache and ST depression	100% LAD, 100% RCA	CAB
Lanza, 2000 <sup>16</sup>	M/68	Smoking, HL	NS	Occipital	NS	NS	NS	NS	NS	Bilateral shoulder pain	Normal	↑	Headache and T wave peaking in V <sub>2-4</sub>	Triple-vessel disease (90% LAD, 90% CXA, 100% RCA)	CAB
Rambihar, 2001 <sup>17</sup>	F/56	NS	NS	Occipital	NS	NS	NS	NS	Yes	Shoulders and left arm	ST depression I, II, aVF, and V <sub>4-6</sub>	NS	Headache and ST depression in I, II, sVF, and V <sub>4-6</sub>	40% LM, 90% CXA, 99% RCA	CAB
	F/NS	NS	NS	Occipital	NS	NS	NS	NS	NS	None	NS	NS	Positive	NS	Death
Amendo, 2001 <sup>18</sup>	F/78	HT, HL	NS	Bitemporal	NS	Severe	Yes	NS	NS	NS	ST elevation in I and aVL	↑	NS	Triple-vessel disease	CAB
	F/77	No	No	Right frontal and maxillary	NS	Severe	NS	NS	NS	None	T inversion	↑	NS	Normal coronary arteries	NS
Auer, 2001 <sup>19</sup>	M/47	Smoking, HL	NA	Occipital	NS	NS	NS	NS	NS	NS	ST elevation	NS	NS	Autopsy: 100%	Death

											in I and aVL and ST depression in II, III, and aVF / Ventricular fibrillation			LAD, 80% RCA	
Famularo, 2002 <sup>20</sup>	M/70	HT, smoking, stroke	No	Bilateral frontoparietal	Sharp	Severe	No	No	NS	Sweating	ST elevation and T-wave inversion V <sub>2</sub> -V <sub>3</sub> and aVF	↑	Normal stress	NS	Medical
Gutiérrez-Morlote, 2002 <sup>21</sup>	M/59	HT, HL, CAD	No	Bilateral, occipital and vertex	Dull, throbbing	Moderate - Severe	Yes	Yes	NS	Chest discomfort and sweating	ST-segment depression	NS	NS	NS	Medical
Martínez, 2003 <sup>22</sup>	F/68	HT, DM, smoking	No	Hemicranial and facial	Shooting	Severe	No	No	Yes	None	Inverted T waves in V <sub>2</sub> -V <sub>4</sub>	NS	Headache and anterior, lateral, and septal ST depression	Triple-vessel disease	PTCA
Sathirapanya, 2004 <sup>23</sup>	M/58	TIA, smoking	No	Left occipital	Sharp, shooting	Severe	No	No	Yes	Chest tightness	ST-T elevation V <sub>1</sub> -V <sub>3</sub>	NS	Positive	Triple-vessel disease	CAB
Chen, 2004 <sup>6</sup>	M/76	HT	NS	Bitemporal	NS	Severe	No	No	Yes	Chest tightness	inverted T waves in leads I and AVL	NS	Headache and ST depression in II, III, and aVF	90% LAD, 50% RCA	PTCA and Medical

Gutiérrez-Morlote, 2005 <sup>24</sup>	F/74	Stroke, DM, obesity	No	Bitemporal	Throbbing	Severe	Yes	NS	NS	Chest tightness, sweating	ST depression in V <sub>2</sub> -V <sub>4</sub>	↑	NS	NS	Medical
	F/64	HT, HL, obesity, DM	No	Unilateral, radiation to jaw	Pressing	Severe	NS	NS	Yes	No	NS	NS	NS	NS	Death
Korantzopoulos, 2005 <sup>25</sup>	F/73	HT, HL, obesity	No	Occipital	Sharp	Severe	Yes	NS	NS	No	ST depression V <sub>2</sub> -V <sub>5</sub>	↑	Normal	70% LAD	Medical
Cutrer, 2006 <sup>26</sup>	M/55	HT, HL, obesity, past smoking	No	Bilateral parietal, radiation to the jaws	NS	NS	No	No	Yes	No	NS	NS	Inferior ischemia	100% RCA, 60% LAD	PCTA
Seow, 2007 <sup>27</sup>	M/35	Smoking	Yes	NS	Explosive	Severe	Yes	No	NS	Sweating	ST elevation V <sub>1-4</sub>	↑	NS	100% LAD	PTCA
Broner, 2007 <sup>28</sup>	F/72	No	No	Bi-occipital, radiating to bi-frontal region	Sharp, throbbing	Severe	Yes	No	No	No	ST elevation II, III and avF and depression in I, avL, V <sub>1</sub> and V <sub>2</sub>	↑	NS	100% RCA	Medical
Wei, 2007 <sup>29</sup>	M/36	Stroke	NS	Vertex, occipital bilateral	Dull	Severe	NS	NS	NS	Cardiac arrest	ST segment elevation V <sub>2</sub> -V <sub>6</sub>	NS	NS	90% LAD	PTCA
	F/85	None	NS	Right eyeball pain	NS	NS	NS	NS	NS	Chest pain	NS	NS	NS	Normal coronary arteries	Medical

														(Apical hypertrophy)	
Wang, 2008 <sup>30</sup>	F/81	HT	NS	NS	NS	Severe	Yes	NS	NS	Diaphoresis, cardiac arrest	Ventricular fibrillation	NS	NS	99% CXA	PTCA
Dalzell, 2009 <sup>31</sup>	F/44	Smoking	NS	Occipital	NS	Severe	Yes	NS	NS	No	Inferior ST elevation and ST-depression in leads V <sub>2</sub> -V <sub>3</sub>	↑	NS	100% RCA	PTCA
Sendovski, 2009 <sup>32</sup>	F/61	HT, HL	NS	Frontal, holocranial, neck, upper back, jaw and teeth	NS	Severe	No	No	Yes	No	ST depression at the lateral wall and a mild ST elevation at the precordial leads	↑	NS	70% LAD, 80% RCA, 95% CXA, 90% PDA	PTCA
Chatzizisis, 2010 <sup>33</sup>	M/42	None	NS	Frontal, bitemporal	NS	Severe	NS	NS	NS	No	Q Wave, mild ST elevation and inverted T wave in V <sub>2</sub> -V <sub>5</sub>	↑	NS	100% LAD	PTCA
Cheng, 2010 <sup>34</sup>	F/52	NS	NS	Bilateral	Throbbing	Severe	Yes	NS	Yes	Chest pain	Normal	↑	NS	Normal coronaries (suspected vasospasm)	Medical
	F/67	HT, DM, HL	No	Bilateral, temporoparietal and jaws	Throbbing	Severe	No	NS	Yes	Dyspnea	Normal	NS	NS	Two-vessel disease	PTCA

Yang, 2010 <sup>35</sup>	F/44	No	NS	Bilateral, frontal, parietal and occipital	NS	Severe	No	No	Yes	Chest tightness	Normal	NS	Headache and ST depression	RCA vasospasm	Medical
Costopoulos, 2011 <sup>36</sup>	M/55	HT, HL, smoking, DM	NS	Occipital to vertex	NS	NS	NS	NS	Yes	Breathlessness	Widespread ST depression	↑	NS	Triple-vessel disease	CAB
Elgharably, 2013 <sup>37</sup>	M/55	Past smoking	No	Frontal	NS	Severe	No	No	NS	Chest pain	Q wave in III and aVF	↑	NS	LAD	PTCA
Asvestas, 2014 <sup>38</sup>	M/86	HT, smoking	NS	Occipital	NS	Severe	NS	NS	NS	No	ST depression in V <sub>1</sub> -V <sub>5</sub> and ST elevation in V <sub>7</sub> -V <sub>9</sub>	↑	NS	Triple-vessel disease (100% CXA, LAD, RCA)	PTCA
Wassef, 2014 <sup>39</sup>	M/44	HL	NS	NS	Pressing	Severe	NS	NS	Yes	Chest discomfort	Normal	NS	Headache and lateral ST segment depression	100% LAD	PTCA
Mathew, 2015 <sup>40</sup>	M/42	HT	Yes	Throbbing, bioccipital to vertex	NS	Variable	No	No	Yes	Palpitations and shortness of breath	NS	NS	Positive	99% LAD	PTCA

Chowdhury, 2015 <sup>41</sup>	M/51	HT	NS	Temporal, frontal, vertex and occipital	NS	NS	No	No	Yes	Chest tightness, sweating	NS	NS	Headache and ST-T changes	70% LAD, 95% CXA	PTCA
Prakash, 2016 <sup>42</sup>	M/67	Smoking	NS	Holocranial	NS	Severe	Yes	No	Yes	No	Q in II, III, aVF	NS	Headache and ST depression in inferior leads	Triple-vessel disease (90% RCA, 75% LAD, 70% CXA)	CAB
Huang, 2016 <sup>43</sup>	F/70	HT, DM, HL	Yes	Bilateral neck pain and temporal	Dull, squeezing	NA	No	No	NS	Dizziness	ST-elevation V <sub>2</sub> -V <sub>6</sub>	↑	NS	LAD	PTCA
Shankar, 2016 <sup>44</sup>	M/73	DM, stroke	No	Holocranial	Dull	severe	NS	NS	Yes	Chest pain	inferior-lateral ST depression	NS	Headache and ST depression in the inferior-lateral leads	Triple-vessel disease	CAB
Wang, 2017 <sup>45</sup>	M/40	Past smoking	NS	Bitemporal	Pulsatile	Moderate	No	No	Yes	Chest discomfort, palpitations, sweating	Inverted T wave	Normal	NS	Triple-vessel disease (100% LAD, 100% RCA, 80% CXA)	PTCA
Majumder, 2017 <sup>46</sup>	F/48	DM	NS	NS	NS	Severe	NS	NS	Yes	NS	ST depression with T-wave inversion in inferior leads	↑	NS	LAD, RCA	PCTA



MacIsaac, 2019 <sup>47</sup>	M/86	No	NS	Bilateral holocranial	Dull	Severe	No	No	No	Chest heaviness and dyspnea	Normal	Normal	Inferolateral ST depression	Triple-vessel disease (90% RCA, 50% LAD, 60% CXA)	Medical
Lazari, 2019 <sup>48</sup>	M/64	Smoking	Yes	Holocranial	Compressing	Severe	NS	NS	NS	No	ST elevation II, III and aVF	NS	NS	RCA	PTCA
Santos, 2019 <sup>49</sup>	M/62	HT, DM	No	Holocranial	NS	Severe	Yes	No	No	Chest pain	no ST elevation	↑	NS	Triple-vessel disease	CAB
Ruiz Ortiz, 2020 <sup>50</sup>	F/78	HT, DM, HL	NS	Vertex, bifrontal, laterocervical	Compressing	Moderate	Yes	No	Yes	No	ST lateral and inferior	↑	NS	Triple-vessel disease	PTCA
Sun, 2021 <sup>51</sup>	F/83	No	NS	NS	NS	NS	NS	NS	NS	No	ST elevation II, III, aVF, V <sub>7</sub> -V <sub>9</sub>	↑	NS	RCA	PTCA
Kobata, 2022 <sup>52</sup>	M/69	Smoking, CAD	NS	Occipital	Pulsatile	Severe	Yes	NS	NS	Chest discomfort, sweating, loss of consciousness	ST elevation in II, III, aVF	↑	NS	RCA	PTCA
Kobata, 2022 <sup>52</sup>	F/66	No	NS	Occipital	NS	Severe	NS	NS	NS	Chest discomfort, sweating	ST elevation in II, III, aVF, V <sub>2</sub> -4	↑	NS	LAD	PTCA
Kobata, 2022 <sup>52</sup>	M/54	Smoking, HT,	NS	Occipital	Strangulation	Moderate	Yes	NS	NS	Chest discomfort, sweating	ST elevation in II, III, aVF	↑	NS	Triple-vessel disease	PTCA

		DM, HL													
Kobata, 2022 <sup>52</sup>	M/72	Smoking, HT	NS	NS	NS	Severe	Yes	NS	NS	No	ST elevation in aVR, ST depression in II, III, aVF and V2-5	↑	NS	Triple- vessel disease	PTCA

*M: Male; F: Female; NS: Not specified; CAB: Coronary artery by-pass; CXA: Circumflex artery; RCA: Right coronary artery; CAD: Coronary artery disease; HT: Hypertension; HL: Hyperlipidemia; PTCA: Percutaneous transluminal coronary angioplasty; LAD: Left anterior descending artery; PDA: posterior descending artery; DM: Diabetes mellitus; LM: Left main; TIA: transient cerebral ischemic attack.*