# Are you a rich guy with a diagonal earlobe crease? 

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A 79-year-old man presented to an internal medicine clinic with a 3-day history of general malaise and abdominal pain at rest. He had a history of hypertension, ischemic heart disease with prior myocardial infarction (2006), and atherosclerosis manifesting as pathological widening of the thoracic and abdominal sections of the aorta. The abdominal part was treated by prosthesis implantation in an open surgery in 2011. The thoracic part was supported by the thoracic endovascular aortic repair in 2013. A physical examination revealed thinning of the skin, numerous ecchymoses and petechiae on the trunk and upper limbs, and dry mucosa. Visible creases on both auricles stemming below the incisura intertragica to the edge of the earlobe were notable. The earlobe fissure described above is known as Frank's sign since 1973. ${ }^{1}$ This sign can be referred to, in a more descriptive way, as diagonal earlobe crease, most commonly angled about 45 degrees to the horizontal plane. The minor angle of the crease is possible, and, in such cases, it is called an earlobe crease (FIGURE 1A). It is observed either on both auricles or unilaterally.
The diagonal earlobe crease is positively correlated with macroangiopathic complications of atherosclerosis. There is no definitive pathophysiological explanation for its existence. Suggested causes are injury and degeneration of collagen fibers of the auricle. Two facts are worth considering in the pathophysiological feature: regional blood supply to the front of the ear by the terminal branches of the superficial temporal artery (anterior auricular branches) and aging-dependent endothelial degenerative processes, which tend to close small diameter vessels. As a consequence, regional hypoperfusion and hypoxia promote proinflammatory status and vasculitis. The pathogenesis and pathophysiology may be similar to those of giant cell arteritis. ${ }^{2}$
The most recent meta-analysis assessing the correlation of Frank's sign with atherosclerosis
and its complications showed a sensitivity of $62 \%$ and specificity of $67 \%{ }^{3}$ These data are confirmed by autopsy reports. Frank's sign was most common in Caucasian patients with ischemic heart disease and aortic aneurysms. Its frequency also positively correlates with age. It is not observed in children and young adults. ${ }^{4}$ In the early phase of crease formation, it can be seen only after night rest and often disappears during the daytime. The largest prospective study to date (over 10000 participants) showed that people over 40 years of age with earlobe crease are at risk of vascular disease due to atherosclerosis. ${ }^{5}$

In our patient, microcytic anemia was diagnosed. A computed tomography scan of the chest and abdomen revealed continuous extension of thoracic aneurysm and endoleak within the lower part of the stent graft (Figure 1B). Abdominal aorta imaging showed formation of pseudoaneurysm within the previous stent grafting area (FIGURE 1C and 1D). The patient received red blood cell transfusion, which led to subjective improvement. After consultation with an interventional radiologist and vascular surgeons, the patient was referred for endovascular aortic repair with implementation of branching stent graft in the abdominal area. A preoperative check-up revealed an albumin level of $37 \mathrm{~g} / \mathrm{l}$ (reference range, $35-54 \mathrm{~g} / \mathrm{l}$ ), lymphocyte count of $12.8 \%$ (20\%-45\%), C-reactive protein level of $35.6 \mathrm{mg} / \mathrm{dl}(<5 \mathrm{mg} / \mathrm{dl})$, and the following lipid levels (obtained with atorvastatin treatment at a dose of 40 mg once daily): total cholesterol, $141 \mathrm{mg} / \mathrm{dl}$ (<190), high--density lipoprotein cholesterol, $37 \mathrm{mg} / \mathrm{dl}$ ( $>40$ $\mathrm{mg} / \mathrm{dl}$ ), and low-density lipoprotein cholesterol, $77 \mathrm{mg} / \mathrm{dl}$ ( $<115 \mathrm{mg} / \mathrm{dl}$ ). Echocardiography revealed an ejection fraction of $45 \%$. The estimated glomerular filtration rate was $20 \mathrm{ml} / \mathrm{min} / 1.73 \mathrm{~m}^{2}$. The Charlson comorbidity index was over 4. Currently, the patient is considering the risk-to-benefit ratio of the recommended approach.


FIGURE 1 A - earlobe crease (white arrow); B - computed tomography scans of a 79-year-old man with atherosclerotic degeneration of the aortic wall with progressive thoracoabdominal aneurysm; C - thoracic stent graft: stent graft space (white arrow), endoleak area (blue arrow); D - abdominal prosthesis with thrombosed pseudoaneurysm (white arrow). The 3-dimensional reconstruction does not contain the area indicated by the arrow because the tissue and thrombus density was equal.

## REFERENCES

1 Frank ST. Aural sign of coronary-artery disease. N Engl J Med. 1973; 289: 327-328.
2 Samson M, Corbera-Bellalta M, Audia S, et al. Recent advances in ou understanding of giant cell arteritis pathogenesis. Autoimmun Rev. 2017. doi:10.1016/j.autrev.2017.05.014

3 Lucenforte E, Romoli M, Zagli G, et al. Ear lobe crease as a marker of coronary artery disease: a meta-analysis. Int J Cardiol. 2014; 175: 171-175

4 Edston E. The earlobe crease, coronary artery disease, and sudden car diac death. Am J Forensic Med Pathol. 2006; 27: 129-133.

5 Christoffersen M, Frikke-Schmidt R, Schnohr P, et al. Visible age-relat ed signs and risk of ischemic heart disease in the general population. Circulation. 2014; 129: 990-998.

