

# Gynecomastia on Computed Tomography of The Chest – Prevalence in A Clinical Population and An Analysis of Possible Causes

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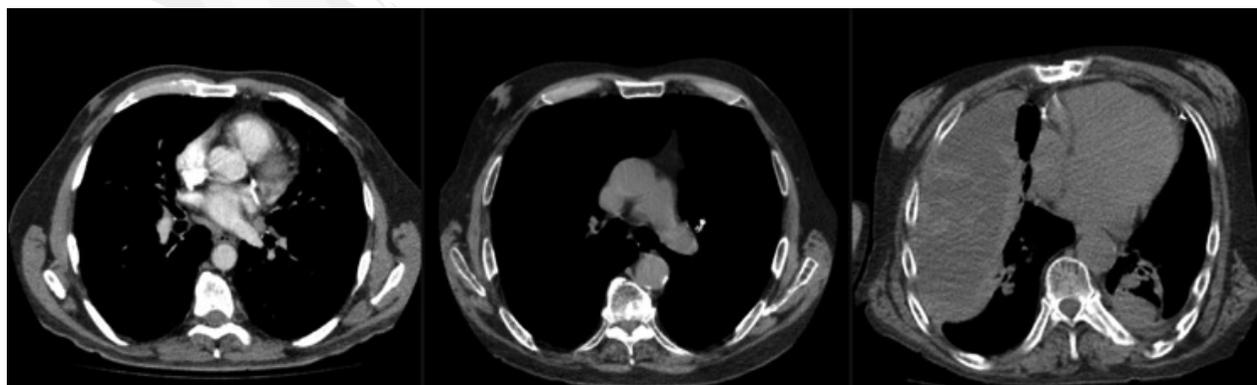
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**Cite this article as:** Gossner J. Gynecomastia on Computed Tomography of The Chest – Prevalence in A Clinical Population and An Analysis of Possible Causes. Eur J Breast Health 2019; 15(1): 67-68.

Dear editor,

Gynecomastia is a common appearance in adolescents as well as elderly men. Pathophysiologically it is caused by an imbalance between testosterone and estrogen. During puberty the cause is an elevated estrogen secretion and in the elderly the cause is a relative increase in estrogen activity due to the reduced levels of secreted testosterone. Gynecomastia can also be caused by hormonal secreting tumors, endocrinological disorders, liver cirrhosis, obesity, medication or drug abuse (1). Gynecomastia has been reported to be a common incidental finding on computed tomography (CT) of the chest, but the prevalence of this finding has not been reported before (2). Therefore, the prevalence of gynecomastia on CT of the chest was studied in this retrospective study. All chest CT scans performed at our department during February 2017 were retrospectively reviewed. The sample consisted of 82 male patients with a mean age of 67 years (range 21-89 years). All patients were examined with a 16-slice CT scanner (Activion®, Toshiba Medical Systems, Tokyo, Japan). The reconstructed 5 mm axial slices were reviewed in a standard soft tissue window setting using the departmental PACS (SynedraView®, Synedra Information Technology, Innsbruck, Austria). Gynecomastia was defined as subareolar tissue measuring more than 2 cm on the axial slices. Because a small amount of breast tissue is considered a normal finding, a cutoff of 2 cm was used according to definitions in the radiological literature (2). In patients with gynecomastia a chart review for possible underlying causes was performed.

In our clinical sample 25.6% of patients showed gynecomastia on CT imaging (21 of 82 patients) (Figure 1). Unilateral Gynecomastia was found in a single case only. In all but one patient (95%) the clinical chart review detected a possible cause for the development of Gynecomastia. Possible causes were adiposities, liver cirrhosis, dialysis, medication with known side effects of gynecomastia (antiandrogens, spironolactone, proton pump inhibitors, pregabalin, chemotherapy) or alcohol/drug abuse.



**Figure 1.** Gynecomastia on computed tomography of the chest in three different patients. On the left side, there is discrete gynecomastia in a patient on spironolactone medication. In the middle, unilateral gynecomastia in a patient on antiandrogenic medication because of prostate cancer can be found. On the right side, there is massive gynecomastia in an adipose patient on medication with pregabalin/proton pump inhibitors

The found high prevalence is in accordance to the published data from an autoptic case series by Glassmann, in this study gynecomastia was found in 40% of examined patients (3). The used definition of gynecomastia in this study is also in accordance to a recent study Klang et al. (4). They reported that a breast tissue diameter of 22 mm on CT imaging represents the 90<sup>th</sup> percentile in the general male population (4). In our study 95% of patients showed a possible etiological factor other than elevated age. This finding must be interpreted with caution. Due to the retrospective design no systematic examination of possible underlying causes could be performed. In a prospective study Mieritz et al. (5) found possible and often reversible causes in 43% of patients presenting with gynecomastia. I.e. our sample of hospitalized patients seems to differ significantly from an ambulatory sample presenting at a dedicated endocrinological service. This is underscored by the fact that 28% of our patients with gynecomastia received chemotherapy for cancer and 9,5% had liver cirrhosis. Gynecomastia was also common in patients with cirrhosis and dialysis in the study by Klang et al. (4). Medication with a possible side effect of gynecomastia was used by 76% of our sample. Usually it is estimated that around 20% of cases of gynecomastia are due to medication side effects, but an exact causal relationship can often not be confirmed (1). The question arises how to manage the incidental finding of gynecomastia on a chest CT. The data of this study suggests a pragmatic and cautious approach in elderly patients, especially in clinical populations. Gynecomastia seems to be common in this group and as shown in our study etiological factors seem to exist in almost all patients. Radiologists should mention the finding of gynecomastia in the report, but further work-up should not be advised based solely on the imaging finding. Sonnenblick et al. (6) showed a high concordance between cross sectional appearance of gynecomastia and mammography, i.e. further imaging is usually not indicated in patients who had undergone cross sectional imaging recently. In contrast, if gynecomastia is the presenting symptom,

the approach has to be different. In these cases, mammography is the imaging test of choice and a detailed analysis of anamnestic and laboratory data is warranted.

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**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** The author has no conflicts of interest to declare.

**Financial Disclosure:** The author declared that this study has received no financial support.

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