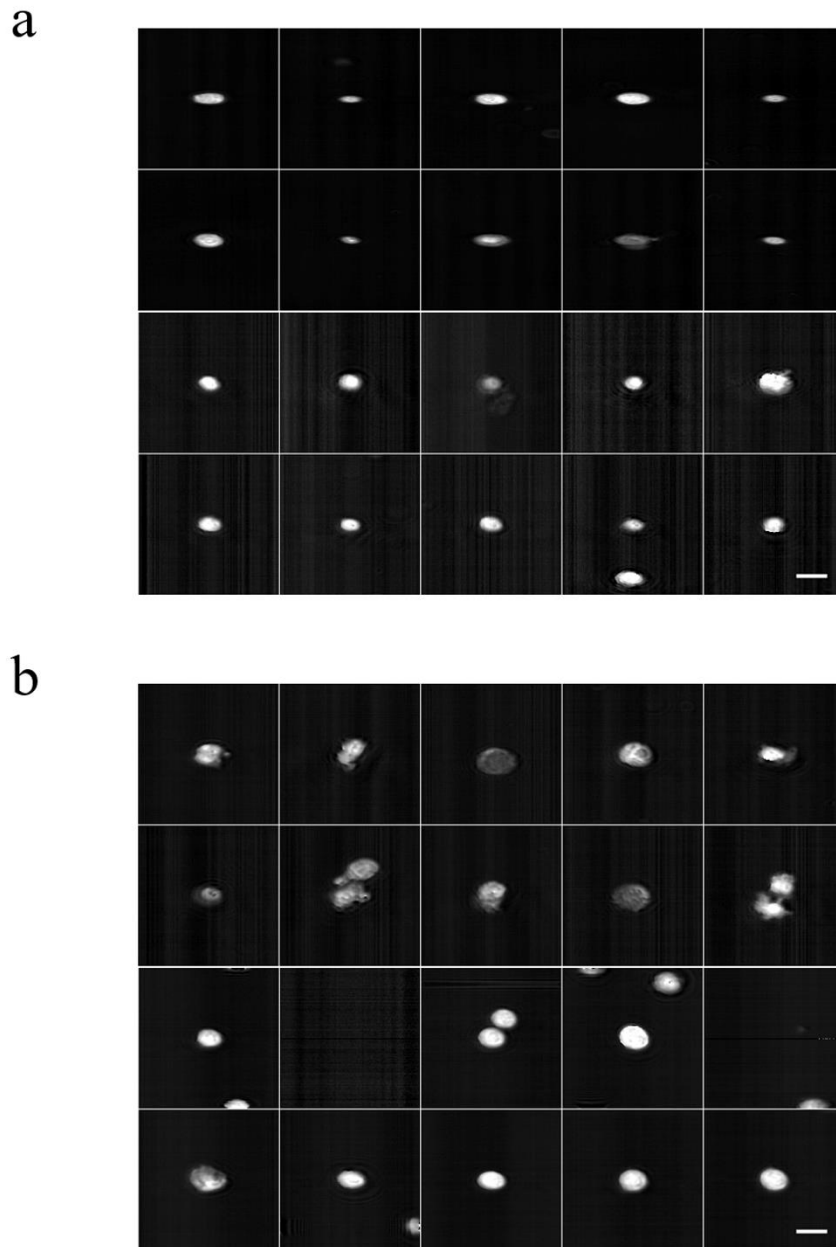
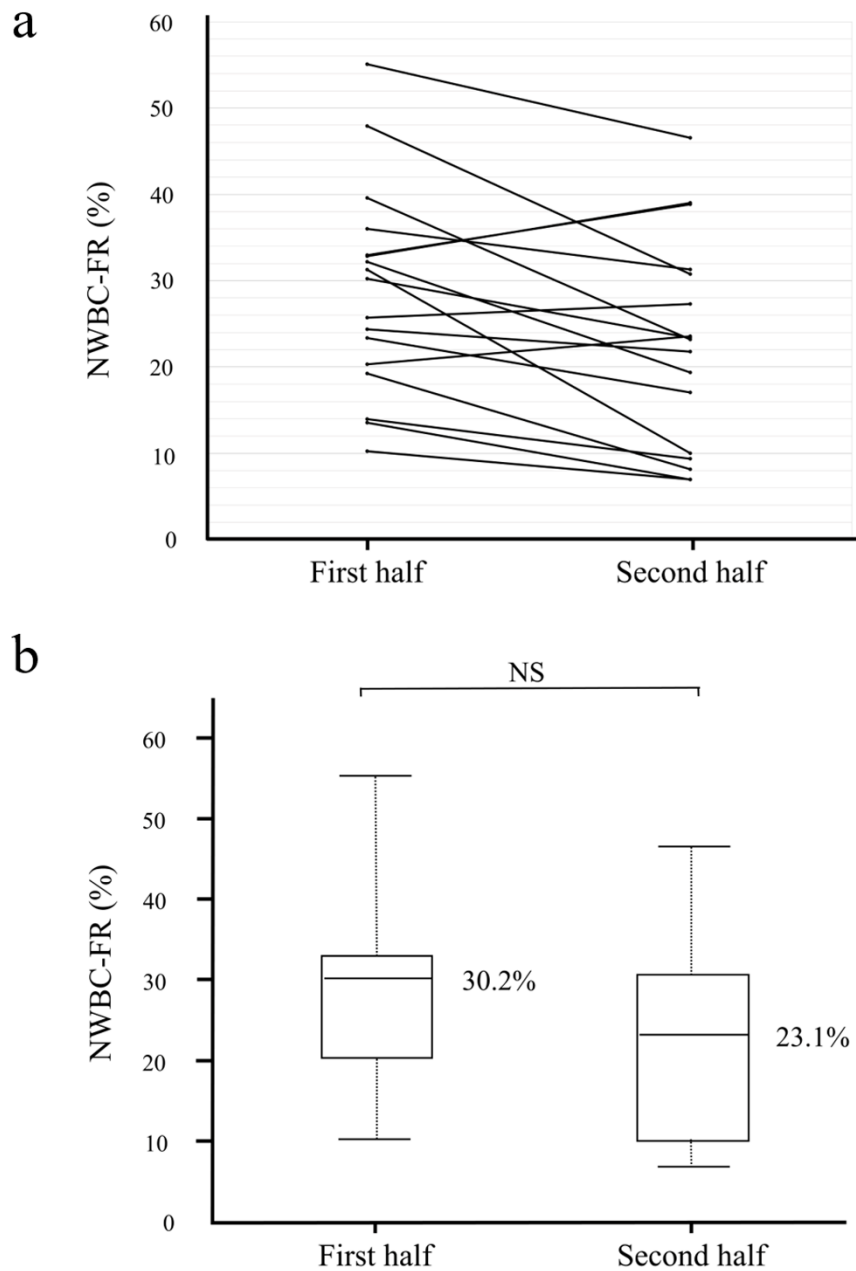


Supplementary Fig. S1. System overview of experimental protocols. (a) Flowcharts

of supervised machine learning of subcellular structures (left) and classification of cells. WBCs, white blood cells. (b) A flowchart of pre-treatment methods of blood samples. PBS, phosphate-buffered saline. (c) A flowchart of imaging processing to extract the histogram of orientation gradients (HOGs). OPL, optical path length.



Supplementary Fig. S2. Representative quantitative phase microscopy (QPM) images of peripheral blood nucleated cells (PBNCs) obtained from cancer patients. (a) QPM images of PBNCs classified as WBCs (positive). (b) QPM images of PBNCs classified as non-WBCs (negative).



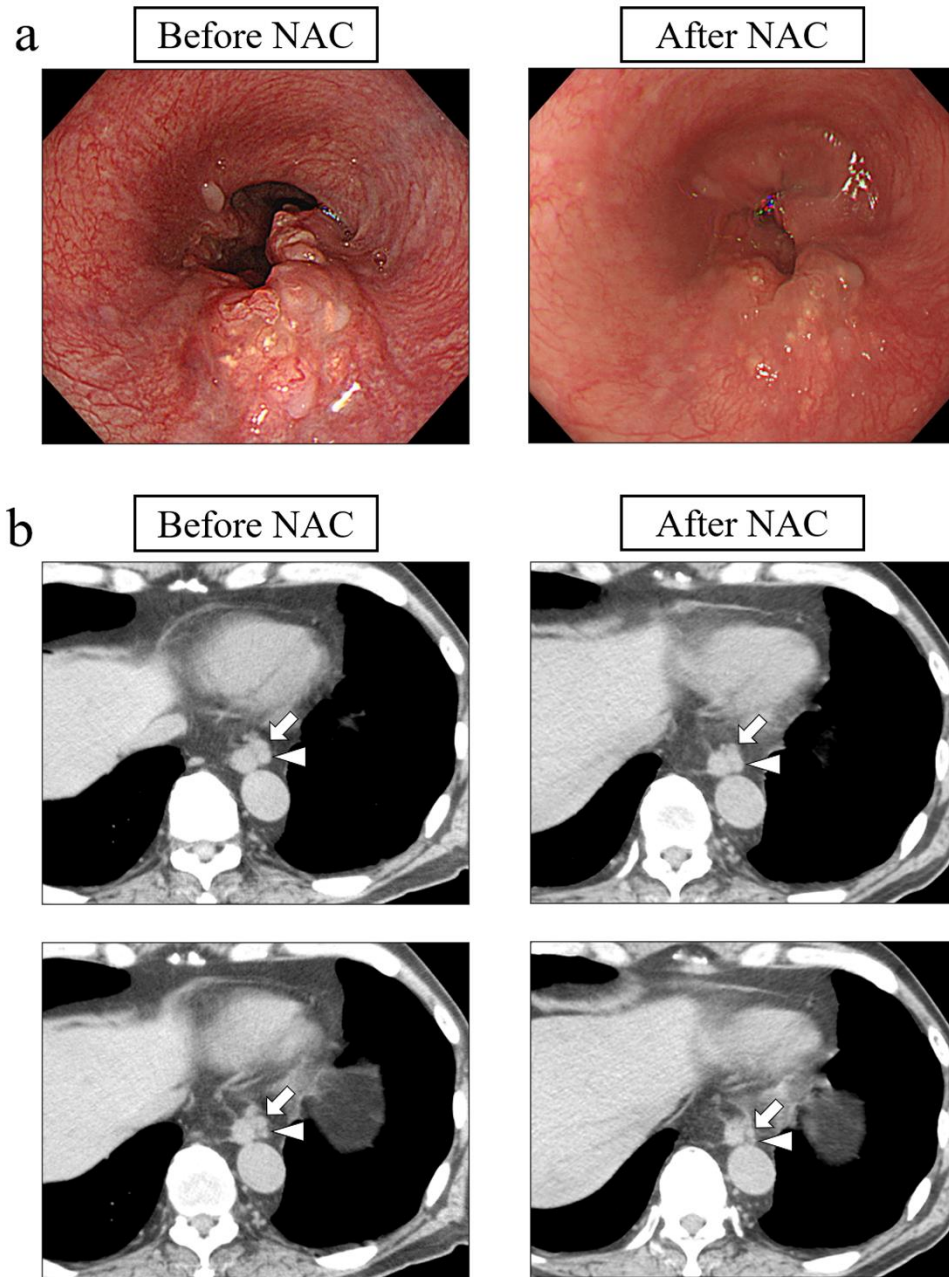
Supplementary Fig. S3. Changes of decision values over the experiment time for 17

blood samples obtained from 16 cancer patients. (a) Trends of non-WBC fraction

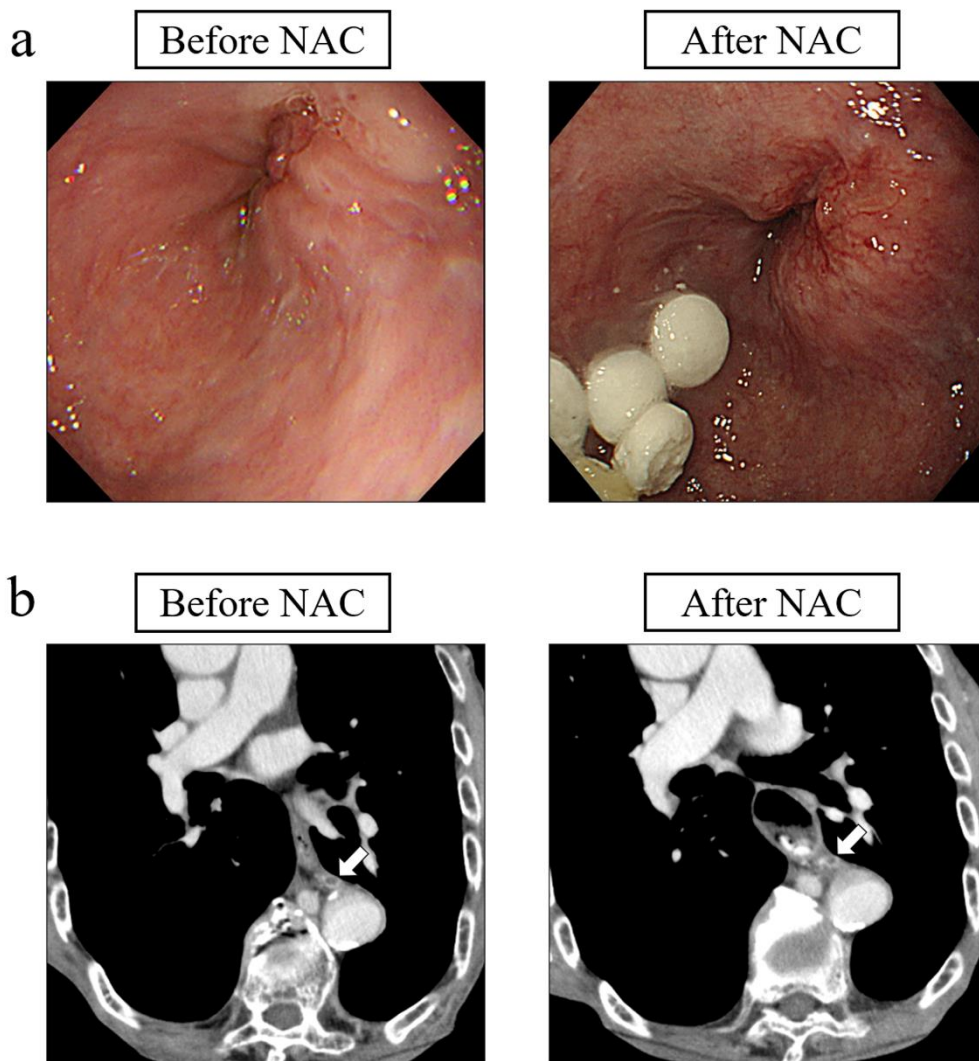
rate (NWBC-FR) between the first and second halves of each experiment. (b)

Distributions and the median values of NWBC-FRs in the first and second halves of 17

experiments. NS, not significant.



Supplementary Fig. S4. Imaging findings of the case whose clinical response to neoadjuvant chemotherapy (NAC) was partial response (PR). (a) Esophagogastroduodenoscopy findings of before (left panel) and after (right panel) NAC. The primary tumor shrank. (b) Computed tomography findings of before (left panels) and after (right panels) NAC. The size of lymph node metastases shrank mildly (arrows and arrowheads, respectively).



Supplementary Fig. S5. Imaging findings of the case whose clinical response to neoadjuvant chemotherapy (NAC) was stable disease (SD). (a) Esophagogastroduodenoscopy findings of before (left panel) and after (right panel) NAC. The primary tumor shrank slightly. Swallowed tablets remained in the thoracic esophagus. (b) Computed tomography findings of before (left panel) and after (right panel) NAC. No change in the size of lymph node metastases was found (arrows).