Great question! Here's a **comparison table** explaining **why SVM was used for adenoid cancer classification** and reasons **why other algorithms might not have been preferred**, based on common considerations in medical imaging or bioinformatics tasks like cancer classification:

✅ Why SVM for Adenoid Cancer Classification?

Algorithm	Used?	Reason for Use / Not Used
SVM (Support Vector Machine)	✅ Yes	Excellent at high-dimensional data, robust in small-to-medium datasets, strong generalization, works well with clear margin separation — common in medical images with well-defined features.

❌ Why Other Algorithms Weren't Used

Algorithm	Used?	Reason NOT Used
Logistic Regression	❌ No	Too simple; assumes linear separation — may not capture non-linearity in image features.
K-Nearest Neighbors (KNN)	❌ No	Computationally expensive with large feature sets; poor with noisy or high-dimensional image data.
Decision Tree	❌ No	Tends to overfit on small datasets unless pruned or ensembled.
Random Forest	❌ No	Better than individual trees, but not always optimal for high-dimensional, sparse medical imaging data.
Gradient Boosting (XGBoost, LightGBM, CatBoost)	❌ No	Powerful but needs more tuning; SVM often preferred for structured, smaller medical datasets.
Naive Bayes	❌ No	Strong independence assumption rarely holds in complex image features.
LDA / QDA	❌ No	Assumes Gaussian distribution; may not hold in real image data, and is sensitive to noise.
Ridge / Lasso Classifiers	❌ No	Regularized linear models; limited in modeling complex decision boundaries.
ANN (Multi-layer Perceptrons)	❌ No	Requires more data to generalize well; overfitting risk in smaller medical datasets.
CNN	❌ No	Ideal for images, but needs a **larger dataset** and more **computational resources** than SVM.

Algorithm	Used?	Reason NOT Used
RNN / LSTM / GRU	❌ No	Suited for sequential data (not relevant for static image classification).
Transformer Models (e.g., BERT)	❌ No	Overkill for non-text tasks unless adapted (like Vision Transformers); requires massive data.
Autoencoders + Classifier	❌ No	Useful for unsupervised pretraining, but more complex and less interpretable.
Graph Neural Networks (GNN)	❌ No	Not suitable unless data is represented as a graph (e.g., cell structures or relationships).