Proof for uniqueness for tree collapsing

1. Assume that a tree can be collapsed such that it yields two distinct collapsed trees that are different from each other
2. These two trees are guaranteed to differ by at least one meta node (where a meta node is comprised of one or more normal nodes), otherwise they would be the same collapsed tree.
3. This meta node differs between the two collapsed trees by one meta node having a node in it that is not present in the other meta node.
4. However, we know that the node that isn’t in the meta node can be collapsed into the meta node, as it is collapsed in the other tree.
5. Therefore, one tree is not completely collapsed, raising a contradiction.
6. Therefore, a tree has a single fully collapsed state.