Example 16 If $|\vec{a}| = 8$, $|\vec{b}| = 3$ and $|\vec{a} \times \vec{b}| = 12$, then value of $\vec{a}.\vec{b}$ is

(A) $6\sqrt{3}$ (B) $8\sqrt{3}$ (C) $12\sqrt{3}$ (D) None of these

Solution (C) is the correct answer. Using the formula $|\vec{a} \times \vec{b}| = |\vec{a}|.|\vec{b}|\,|\sin\theta|$, we get

$\theta = \pm\frac{\pi}{6}$.

Therefore, $\vec{a}.\vec{b} = |\vec{a}|.|\vec{b}|\cos\theta = 8 \times 3 \times \frac{\sqrt{3}}{2} = 12\sqrt{3}$.