An algebra $A$ is Bernstein if it has a representation $\omega$ on its ground field $K$, and satisfies $(x^2)^2 = \omega(x^2)x^2$, all $x \in A$. Suppose $A$ commutative and $\text{char} K \neq 2$. It has a decomposition $A = Ke \oplus U \oplus V$, where $e$ is an idempotent, $U = \{u: eu = \frac{1}{2}u\}$, $V = \{v: ev = 0\}$. A. Worz-Buskeros [same journal 48 (1987), no. 5, 388–398; MR0888867 (88d:17024)] showed that the condition $V^2 = V(VU) = 0$ is sufficient for a Bernstein algebra to be Jordan, and gave a more complicated necessary condition. The present authors show that the condition just quoted is also necessary. A Bernstein algebra is orthogonal if $U^3 = 0$ [the reviewer, J. London Math. Soc. (2) 9 (1974/75), 613–623; MR0465270 (57 #5175)]. The authors show that every Bernstein algebra for which either $\dim U \leq 2$, or $\dim V \leq 1$, is orthogonal. They construct a nonorthogonal example with $\dim U = 3$, $\dim V = 2$.

P. Holgate