Conjecture involving the numbers obtained concatenating the square of a prime p with p then with 1

Abstract. In this paper I make the following conjecture: there exist an infinity of primes obtained concatenating the square of a prime p with p then with 1 and then subtracting 2 from the resulting number (example: 127^2 = 16129 and the number 161291271 - 2 = 161291269 is prime)

Conjecture:

There exist an infinity of primes q obtained concatenating the square of a prime p with p then with 1 and then subtracting 2 from the resulting number.

Example:
: 127^2 = 16129 and the number 161291271 - 2 = 161291269 is prime.

The sequence of primes q:

: q = 929 for (p, p^2 = 3, 9);
: q = 2549 for (p, p^2 = 5, 25);
: q = 4969 for (p, p^2 = 7, 49);
: q = 169129 for (p, p^2 = 13, 169);
: q = 289169 for (p, p^2 = 17, 289);
: q = 529229 for (p, p^2 = 23, 529);
: q = 841289 for (p, p^2 = 29, 841);
: q = 1369369 for (p, p^2 = 37, 1369);
: q = 2809529 for (p, p^2 = 53, 2809);
: q = 5041709 for (p, p^2 = 71, 5041);
: q = 7921889 for (p, p^2 = 89, 7921);
: q = 127691129 for (p, p^2 = 113, 12769);
: q = 161291269 for (p, p^2 = 127, 16129);
: q = 176611309 for (p, p^2 = 131, 17161);
: q = 187691369 for (p, p^2 = 137, 18769);
: q = 445212109 for (p, p^2 = 211, 44521);
: q = 515292269 for (p, p^2 = 227, 51529);
: q = 524412289 for (p, p^2 = 229, 52441);
: q = 979693129 for (p, p^2 = 313, 97969);
: q = 1772414209 for (p, p^2 = 421, 177241);
: q = 1857614309 for (p, p^2 = 431, 185761);
: q = 2143694629 for (p, p^2 = 463, 214369);
(...)

Note the chain of four primes 127691129, 161291269, 176611309, 187691369 obtained for four consecutive primes p (113, 127, 131, 137).