

Supplementary materials

Table S1: Clinical observational parameters score.

Observational parameters	Score			
	0	1	2	3
Pain score	None	Mild (occasional vocalization)	Moderate (frequent vocalization)	Severe (vociferous vocalization, withdraws limb, bites, struggles)
Swelling score	None	Mild	Obvious	N/A*
Exudation score	None	Mild (single 2×2 gauze wipe sufficient)	Moderate (two 2×2 gauze wipe sufficient)	Severe (three or more 2×2 gauze wipe used)

*N/A: Not Applicable

Table S2: Lameness scoring.

Lameness score	Observations
0	No lameness observed
1	Mild: Weight bearing lameness
2	Moderate: Weight bearing lameness with intermittent non-weight bearing
3	Severe: Non-weight bearing lameness with brief intermittent weight bearing
4	Non-weight bearing lameness at all times

Table S3: Modified radiographic score by (Yang et al., 1994).

Grading category	Score
Periosteal reaction	
None	0
Minimal (localized to the gaps)	1
Medium (extends over the gaps or towards ulna)	2
Moderate (1/4 to 1/2 of the defect area)	3
Full (1/2 to full length of defect)	4
Osteotomy line	
Both the osteotomy lines completely radiolucent	0
One of the osteotomy lines partially radiolucent	1
Both the osteotomy lines partially radiolucent	2
One of the osteotomy lines invisible	3
Both the osteotomy lines invisible	4
Construct appearance (*not applicable)	
Unchanged/intact	0
Mild resorption (one localized area)	1
Moderate resorption (more than one localized area)	2
Mostly replaced	3
Fully replaced	4
Defect filling score	
No change in critical sized defect	0
1-25% CSD filled with bony/cartilaginous tissue	1
25-50% CSD filled with bony/cartilaginous tissue	2
50-75% CSD filled with bony/cartilaginous tissue	3
75-100% CSD	4

*The experiment scaffold was radiolucent in skiagram. Hence evaluation of construct appearance was not applicable.

Table S4: Modified Lane and Sandhu (1987) and Heiple et al. (1987) histopathological scoring system.

Sl. No	Feature	Score
Histopathological scoring system		
A	Osteogenesis	
1	No osteogenesis	0
2	Weak osteogenesis	1
3	Medium osteogenesis	2
4	Good osteogenesis	3
5	Perfect osteogenesis	4
B	Union	
1	No evidence of union	0
2	Fibrous union	1
3	Osteochondral union	2
4	Bony union	3
5	Complete organization of graft	4
C	Marrow	
1	None in the resected area	0
2	Beginning to appear	1
3	Present in greater than 1 /2 defect	2
4	Complete colonization by red marrow	3
5	Mature fatty marrow	4
D	Cancellous bone/medullary bone	
1	No osseous cellular activity	0
2	Early apposition of new bone	1
3	Active apposition of new bone	2
4	Reorganizing cancellous bone	3
5	Complete re-organization of cancellous bone	4
E	Cortical/compact bone	
1	None	0
2	Early appearance	1
3	Formation underway	2
4	Mostly re-organized	3
5	Completely formed	4

Table S5: The mean±SD of heart rate of various treatment groups at different time intervals.

Group	Time interval in days							
	Pre	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
A	247.5±14.82 ^a	250±48.76 ^a	246.83±10.36 ^a	250±22.52 ^a	258±25.95 ^a	229.67±21.74 ^a	245±20.93 ^a	246.5±23.71 ^a
B	248.83±28.27 ^a	258.5±20.7 ^a	249.17±13.79 ^a	247.67±46.37 ^a	243.33±9.97 ^a	256.67±27.62 ^a	256.83±21.14 ^a	235.83±34.16 ^a
C	248.83±21.89	259.17±24.55 ^a	258.33±21.63 ^a	240.83±24.24 ^a	268.67±24.8 ^a	247±24.66 ^a	236.67±30.71 ^a	245.83±21.4 ^a
D	248.67±36.06 ^a	244.5±23.26 ^a	260.67±27.22 ^a	247±20.75 ^a	248.33±36.81 ^a	251±22.2 ^a	250.67±34.62 ^a	243.67±23.28 ^a
E	240.67±16.44 ^a	241.17±16.47 ^a	236.5±16.57 ^a	231.83±21.66 ^a	223.67±35.83 ^a	245.83±20.02 ^a	252±24.27 ^a	249.33±21.37 ^a
F	252.83±25.66 ^a	248.83±21.79 ^a	233±23.17 ^a	234.83±41.94 ^a	253.33±19.91 ^a	247.17±21.08 ^a	226.17±22.97 ^a	247.83±22.64 ^a

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S6: The mean±SD of respiratory rate of various treatment groups at different time intervals.

Group	Time interval in days							
	Pre	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
A	50.83±7.6 ^a	53.33±6.86 ^a	48.5±13.14 ^a	48±11.4 ^a	46.67±11.33 ^a	48.5±11.84 ^a	48.67±7.47 ^a	55.33±10.56 ^a
B	58±10.35 ^a	49.5±11.15 ^a	50±9.38 ^a	53.17±7.63 ^a	53.17±9.91 ^a	43.67±6.89 ^a	47.17±13.45 ^a	48.5±5.96
C	49.83±9.68 ^a	51.5±11.84 ^a	52.33±7.58 ^a	49.5±9.57 ^a	47.33±8.12 ^a	45.5±9.54 ^a	47±10.14	46±6.99 ^a
D	50.17±8.42 ^a	53±8.34 ^a	47.5±15.42 ^a	52.17±7.96 ^a	51.17±9.2 ^a	46±10.24 ^a	53.67±7.47 ^a	49.5±10.33 ^a
E	55±9.36 ^a	55.17±10.4 ^a	53.17±12.3 ^a	50.33±9.18 ^a	52.5±7.01 ^a	51.5±11.43 ^a	55.33±7.63 ^a	49.83±6.55 ^a
F	47.33±8.04 ^a	51±6.69 ^a	54.67±10.82 ^a	43±10.75 ^a	51±9.34 ^a	53.67±13.6 ^a	45.67±11.99 ^a	44.5±10.37 ^a

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S7: The mean±SD of rectal temperature of various treatment groups at different time intervals.

Group	Time interval in days							
	Pre	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
A	101.77±0.66 ^a	101.48±0.5 ^a	101.82±0.62 ^a	101.85±0.58 ^a	102±0.76 ^a	101.93±0.84 ^a	86.58±37.39 ^a	101.7±0.75 ^a
B	101.18±0.9 ^a	101.63±0.39 ^a	101.28±0.84 ^a	101.35±0.82 ^a	101.22±0.79 ^a	101.22±0.79 ^a	101.33±0.65 ^a	100.98±0.78 ^a
C	101.5±0.76 ^a	101.07±0.31 ^a	101.65±0.72 ^a	101.68±0.83 ^a	101.62±0.78 ^a	101.62±0.78 ^a	101.57±0.74 ^a	101.68±0.85 ^a
D	100.92±1.01 ^a	101.8±0.85 ^a	101.47±0.77 ^a	101.62±0.73 ^a	101.25±0.71 ^a	101.25±0.71 ^a	101.27±0.44 ^a	101.52±0.61 ^a
E	101.38±1.29 ^a	100.87±1.01 ^a	101.58±0.75 ^a	101.43±0.94 ^a	101.53±0.98 ^a	101.53±0.98 ^a	101.45±0.98 ^a	101.47±0.82 ^a
F	101.32±0.64 ^a	101.07±0.85 ^a	101.8±0.54 ^a	101.52±0.6 ^a	101.47±0.61 ^a	101.47±0.61 ^a	101.53±0.67 ^a	101.6±0.49 ^a

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S8: The mean±SD of pain score of various treatment groups at different time intervals.

Group	Time interval in days													
	Pre	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 30	Day 60	Day 90
A	0±0	3±0 [*]	3±0 [*]	3±0 [*]	3±0 [*]	3±0 [*]	2.83±0.41 ^{a*}	2.5±0.55 [*]	2.5±0.55 [*]	2.33±0.52 [*]	2.33±0.52 ^{a*}	0.83±0.41 [*]	0.5±0.55 ^a	0.33±0.52
B	0±0	3±0 [*]	3±0 [*]	3±0 [*]	2.83±0.41 [*]	3±0 [*]	2±0 ^{b*}	2±0 [*]	2±0 [*]	2±0 [*]	2.17±0.41 ^{b*}	0±0	0±0 ^b	0±0
C	0±0	3±0 [*]	3±0 [*]	3±0 [*]	2.83±0.41 [*]	3±0 [*]	2.17±0.41 ^{b*}	2.17±0.41 [*]	2.17±0.41 [*]	2.17±0.41 [*]	2.17±0.41 ^{b*}	0±0	0±0 ^b	0±0
D	0±0	3±0 [*]	3±0 [*]	3±0 [*]	2.83±0.41 [*]	3±0 [*]	2.17±0.41 ^{b*}	2.33±0.52 [*]	2±0 [*]	2.33±0.52 [*]	2.33±0.52 ^{b*}	0±0	0.17±0.41 ^{ab}	0±0
E	0±0	3±0 [*]	3±0 [*]	3±0 [*]	2.83±0.41 [*]	2.83±0.41 [*]	2±0 ^{b*}	2.17±0.41 [*]	2±0 [*]	2±0 [*]	2.33±0.52 ^{a*}	0.33±0.52	0.33±0.52 ^{ab}	0±0
F	0±0	3±0 [*]	3±0 [*]	3±0 [*]	2.83±0.41 [*]	3±0 [*]	2±0 ^{b*}	2.17±0.41 [*]	2±0 [*]	2.17±0.41 [*]	2.17±0.41 ^{a*}	0.33±0.52	0.5±0.55 ^{ab}	0±0

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S9: The mean±SD of swelling score of various treatment groups at different time intervals.

Group	Time interval in days													
	Pre	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 30	Day 60	Day 90
A	0±0	1.67±0.52 [*]	1.5±0.55 [*]	1.33±0.52 [*]	1.33±0.52 [*]	1±0 [*]	0.5±0.55	0.33±0.52	0.33±0.52	0.17±0.41	0±0	0±0	0±0	0±0
B	0±0	1.17±0.41 [*]	1.33±0.52 [*]	1.17±0.41 [*]	1.33±0.52 [*]	0.83±0.41 [*]	0.33±0.52	0.17±0.41	0±0	0±0	0±0	0±0	0±0	0±0
C	0±0	1.33±0.52 [*]	1.17±0.41 [*]	1±0 [*]	1±0 [*]	1±0 [*]	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0
D	0±0	1.33±0.52 [*]	1.17±0.41 [*]	1.33±0.52 [*]	1.33±0.52 [*]	1.17±0.41 [*]	0±0	0.17±0.41	0±0	0±0	0±0	0±0	0±0	0±0
E	0±0	1.33±0.52 [*]	1.67±0.52 [*]	1±0 [*]	1±0 [*]	1±0 [*]	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0
F	0±0	1.33±0.52 [*]	1.33±0.52 [*]	1±0 [*]	1±0 [*]	1±0 [*]	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S10: The mean±SD of exudation score of various treatment groups at different time intervals.

Group	Time interval in days													
	Pre	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 30	Day 60	Day 90
A	0±0	2.17±0.75 [*]	2.5±0.55 ^{ab*}	2.67±0.52 ^{a*}	2.17±0.41 ^{a*}	1.17±0.41 [*]	0.83±0.41 ^{a*}	0.5±0.55	0.33±0.52	0.17±0.41	0±0	0±0	0±0	0±0
B	0±0	2±0.89 [*]	2.17±0.41 ^{a*}	1.83±0.98 ^{ab*}	1.67±0.82 ^{ab*}	1.33±0.52 [*]	0.67±0.52 ^{ab*}	0.17±0.41	0±0	0±0	0±0	0±0	0±0	0±0
C	0±0	1.83±0.75 [*]	2.33±0.52 ^{a*}	1.83±0.98 ^{ab*}	1.17±0.41 ^{b*}	1.17±0.41 [*]	0.67±0.52 ^{ab*}	0.17±0.41	0±0	0±0	0±0	0±0	0±0	0±0
D	0±0	1.67±0.82 [*]	1.17±0.75 ^{b*}	1.17±0.75 ^{b*}	0.83±0.75 ^b	0.83±0.75	0.17±0.41 ^b	0.17±0.41	0±0	0±0	0±0	0±0	0±0	0±0
E	0±0	1.83±0.75 [*]	1.67±0.82 ^{ab*}	1.5±0.55 ^{b*}	1.17±0.41 ^{b*}	1.17±0.41 [*]	0.17±0.41 ^b	0.17±0.41	0.17±0.41	0.17±0.41	0.17±0.41	0±0	0±0	0±0
F	0±0	1.83±0.75 [*]	1.5±0.84 ^{ab*}	1.33±0.52 ^{b*}	1±0.63 ^{b*}	1±0.63 [*]	0.33±0.52 ^{ab}	0.33±0.52	0.17±0.41	0±0	0±0	0±0	0±0	0±0

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S11: The mean±SD of lameness score of various treatment groups at different time intervals.

Group	Time interval in days						
	Pre	Day 1	Day 15	Day 30	Day 45	Day 60	Day 90
A	0±0	4±0*	4±0*	4±0*	3.83±0.41 ^{a*}	3.5±0.55 ^{a*}	2.5±0.55 ^{a*}
B	0±0	4±0*	3.67±0.52*	3.67±0.52*	3.5±0.55 ^{ab*}	2.83±0.41 ^{b*}	2±0.89 ^{a*}
C	0±0	4±0*	3.83±0.41*	3.83±0.41*	3.33±0.52 ^{ab*}	2.5±0.55 ^{b*}	1.83±0.98 ^{a*}
D	0±0	4±0*	3.83±0.41*	3.67±0.52*	3.33±0.52 ^{ab*}	2.17±0.75 ^{bc*}	1.33±0.82 ^{ab*}
E	0±0	4±0*	3.83±0.41*	3.67±0.52*	3.5±0.55 ^{ab*}	2.33±0.52 ^{b*}	1±0.89 ^{ab}
F	0±0	4±0*	3.83±0.41*	3.67±0.52*	3±0.63 ^{b*}	1.5±0.55 ^{a*}	0.5±0.55 ^b

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S12: The mean±SD of left hind foot stride length (cm) of various treatment groups at different time intervals.

Group	Time interval in days						
	Pre	Day 1	Day 15	Day 30	Day 45	Day 60	Day 90
A	31.83±1.17 ^a	31.42±0.92 ^a	30.33±1.21 ^a	30.25±1.08 ^a	30.25±1.25 ^a	28.83±6.05 ^a	31.25±0.88 ^a
B	31.33±1.37 ^a	29.97±1.33 ^a	28.42±5.92 ^a	30.83±1.21 ^a	29.58±1.56 ^a	30.25±2.19 ^a	31.67±3.39 ^a
C	32.17±0.52 ^a	30.17±1.91 ^a	31.5±1.26 ^a	31.25±0.99 ^a	31±1.41 ^a	31.75±3.34 ^a	31.67±0.41 ^a
D	30.83±1.81 ^a	29.42±2.2 ^a	28.83±0.75 ^a	28.92±1.2 ^a	29.25±2.36 ^a	28.25±1.08 ^a	28.83±2.04 ^a
E	30.92±1.86 ^a	30.08±1.16 ^a	29.33±1.99 ^a	30.08±1.16 ^a	29.83±1.17 ^a	29.92±0.92 ^a	30.42±1.11 ^a
F	32±0.71 ^a	30.17±0.82 ^a	29.75±0.69 ^a	29.5±1.9 ^a	30.25±1.08 ^a	30.17±0.75 ^a	30.17±0.98 ^a

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S13: The mean±SD of right hind foot stride length (cm) of various treatment groups at different time intervals.

Group	Time interval in days						
	Pre	Day 1	Day 15	Day 30	Day 45	Day 60	Day 90
A	31.83±1.17 ^a	30.42±0.8 ^a	30±1.26 ^a	30.58±0.92 ^a	30.25±1.25 ^a	27.5±6.72 ^a	30.58±0.92 ^a
B	30.83±1.33 ^a	29.97±1.33 ^a	27.75±5.77 ^a	29.83±1.13 ^a	29.83±1.72 ^a	30±2 ^a	30.08±0.92 ^a
C	30.83±1.44 ^a	29.42±1.28 ^a	29.92±1.36 ^a	29.33±1.03 ^a	29.58±1.11 ^a	31.92±3.41 ^a	29.5±1.05 ^a
D	29.08±2.65 ^a	28.33±1.54 ^a	28.75±1.6 ^a	28.42±1.5 ^a	29.83±1.72 ^a	28.58±1.28 ^a	28.5±1.52 ^a
E	30±1.48 ^a	29.17±2.07 ^a	28.58±2.11 ^a	28.83±1.63 ^a	29.42±1.63 ^a	29±1.41 ^a	29±1.52 ^a
F	31.25±1.33 ^a	30.17±1.21 ^a	30.08±1.16 ^a	30.17±1.21 ^a	30±1.26 ^a	30.08±1.02 ^a	30.67±1.03 ^a

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S14: The mean±SD of left forefoot stride length (cm) of various treatment groups at different time intervals.

Group	Time interval in days						
	Pre	Day 1	Day 15	Day 30	Day 45	Day 60	Day 90
A	30.67±1.21 ^a	30.42±0.8 ^a	30.5±0.84 ^a	30.5±0.84 ^a	30.33±1.03 ^a	30.33±1.03 ^a	30.58±0.92 ^a
B	30.83±1.33 ^a	29.75±1.17 ^b	29.83±1.13 ^a	29.83±1.13 ^a	29.83±1.17 ^a	29.83±0.98 ^a	30.08±0.92 ^a
C	29.83±0.93 ^a	29.42±1.28 ^a	29.5±1.22 ^a	29.5±1.22 ^a	29.58±1.11 ^a	29.5±1.05 ^a	29.5±1.05 ^a
D	28.83±1.72 ^a	28.33±1.54 ^a	28.5±1.55 ^a	28.33±1.54 ^a	28.33±1.37 ^a	28.58±1.28 ^a	28.75±1.54 ^a
E	29.08±1.88 ^a	28.33±1.66 ^a	28.67±1.25 ^a	28.33±1.66 ^a	28.33±1.4 ^a	28.42±1.11 ^a	28.83±1.63 ^a
F	29.5±0.89 ^a	29.67±0.88 ^a	29.58±0.8 ^a	29.67±0.88 ^a	29.58±0.8 ^a	29.67±0.82 ^a	30.17±0.98 ^a

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S15: The mean±SD of right fore foot stride length (cm) of various treatment groups at different time intervals.

Group	Time interval in days						
	Pre	Day 1	Day 15	Day 30	Day 45	Day 60	Day 90
A	30.17±3.31 ^a	30.17±3.5	25.92±3.31 [*]	22±2.68 ^{**}	20.25±5.96 ^{**}	22.83±3.37 ^{***}	24±2.97 ^{**}
B	30±1.26 ^a	29.25±2.72	25.67±4.23 [*]	25.75±2.27 [*]	23.58±1.5 [*]	23.92±3.58 ^{ab}	26.92±1.96 ^{ab**}
C	30.17±1.57 ^a	33.75±2.82 ^{**}	27.67±2.4	25.42±1.11 [*]	24.08±2.25 ^{**}	27.58±2.54 ^{bc}	29.33±1.03 ^b
D	27.83±1.47 ^a	30.25±2.4	24.17±2.8	24.08±2.97	23±1.92	31.25±1.54 ^c	28.5±1.52 ^b
E	28.33±1.37 ^a	31.25±2.32 [*]	23.92±2.71 [*]	23.75±1.97 [*]	23.5±2.05	24.83±1.29 ^{ab}	28.33±0.98 ^b
F	29.5±0.89 ^a	32±2.3	24±2.47 ^{**}	23.92±1.91 ^{**}	23.17±1.51 ^{**}	26.17±1.94 ^{ab}	30.17±0.98 ^b

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S16: The mean±SD of fore foot step length (cm) of various treatment groups at different time intervals.

Group	Time interval in days						
	Pre	Day 1	Day 15	Day 30	Day 45	Day 60	Day 90
A	9±1.41 ^a	4.86±1.75 ^{a**}	4.29±1.11 ^{a**}	4.43±1.17 ^{a**}	4.21±1.52 ^{a**}	5.21±1.63 ^{a**}	6±1.12 ^{a**}
B	8.42±0.92 ^a	6.79±1.31 ^{ab}	6.83±1.63 ^b	7.57±1.94 ^b	7.67±1.89 ^b	7.92±1.66 ^b	7.08±1.36 ^{ab}
C	9.75±1.08 ^a	7.17±0.88 ^{b**}	7.29±1.42 ^{b**}	7.33±0.93 ^{b*}	7.42±1.8 ^{b*}	8.67±1.78 ^b	8.42±0.8 ^{bc}
D	8.25±1.13 ^a	7.08±0.97 ^b	7.08±0.97 ^b	7.33±1.4 ^b	7.42±0.58 ^b	7.5±1.38 ^{ab}	8.17±1.29 ^{bc}
E	9.08±1.53 ^a	7.83±1.13 ^b	8.17±0.93 ^b	7.5±1.05 ^b	8.83±1.57 ^b	8.75±1.21 ^b	9.42±1.11 ^c
F	9.08±0.66 ^a	7.92±0.86 ^b	8.08±0.38 ^b	7.92±0.58 ^b	7.75±0.42 ^b	8±0.71 ^b	8.25±0.82 ^{bc}

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S17: The mean±SD of drag mark length (cm) of various treatment groups at different time intervals.

Group	Time interval in days						
	Pre	Day 1	Day 15	Day 30	Day 45	Day 60	Day 90
A	0±0 ^a	22.92±2.85 ^{a**}	3.5±1.38 ^{a**}	3±0.95 ^{a**}	2.25±1.86 ^{a**}	1.33±1.54 ^{a**}	0.33±0.82 ^a
B	0±0 ^a	9.17±7.93 ^{b*}	0±0 ^b	0±0 ^b	0±0 ^b	0±0 ^b	0±0 ^a
C	0±0 ^a	5.92±7 ^b	1.58±3.88 ^b	0±0 ^b	0±0 ^b	0±0 ^b	0±0 ^a
D	0±0 ^a	7.75±7.03 ^b	0±0 ^b	0±0 ^b	0±0 ^b	0±0 ^b	0±0 ^a
E	0±0 ^a	4.67±5.27 ^b	0±0 ^b	0±0 ^b	0±0 ^b	0±0 ^b	0±0 ^a
F	0±0 ^a	4.5±5.23 ^b	0±0 ^b	0±0 ^b	0±0 ^b	0±0 ^b	0±0 ^a

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “**” means $p < 0.01$.

Table S18: The mean±SD of blood glucose (mg/dL) of various treatment groups at different time intervals.

Group	Day 0	Day 30	Day 60	Day 90
A	105.5±7.18	106±7.24	106±4.69	107.67±5.68
B	106.83±7.41	107.5±5.82	105.5±2.26	105.67±3.39
C	107.33±6.28	106.33±3.08	106.33±4.63	104.67±2.42
D	106±6.23	106±4.69	109.5±6.02	106.17±5.42
E	106.67±6.47	106.83±3.31	104±1.41	105.17±2.64
F	108.83±6.97	105±2.83	105.67±4.5	105.33±6.44

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “**” means $p < 0.01$.

Table S19: The mean±SD of serum total protein (g/dL) of various treatment groups at different time intervals.

Group	Day 0	Day 30	Day 60	Day 90
A	6.95±0.88	6.38±1.44	5.95±0.68 [*]	5.64±0.69 [*]
B	6.91±0.88	6.44±0.74	5.97±0.32	6.01±0.63
C	6.76±1.05	6.85±1.04	6.22±0.49	6.37±0.7
D	6.12±0.71	7.35±1.34	6.22±0.78	6.07±0.97
E	6.71±0.75	6.36±0.85	5.83±0.82	6.16±0.71
F	6.36±0.63	6.82±0.58	6.21±0.74	6.48±0.72

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “**” means $p < 0.01$.

Table S20: The mean±SD of serum alkaline phosphatase (IU/L) of various treatment groups at different time intervals.

Group	Day 0	Day 30	Day 60	Day 90
A	20.35±3.42 ^a	27.43±3.76 ^{a**}	34.24±5.24 ^{a**}	31±3.16 ^{a**}
B	19.99±2.36 ^a	25.58±4.77 ^{a*}	34.56±4.02 ^{a**}	32.56±3.35 ^{a**}
C	20.19±3.99 ^a	30±4.58 ^{ab**}	37.28±9.05 ^{a**}	30.82±7.45 ^{a**}
D	19.78±4.51 ^a	35.17±3.97 ^{b**}	59.73±5.28 ^{b**}	53.29±7.45 ^{b**}
E	18.16±2.33 ^a	28.47±4.75 ^{a*}	38.35±3.94 ^{a**}	37.86±7.06 ^{a**}
F	19.58±2.88 ^a	35.44±3.61 ^{b**}	61.58±4.67 ^{b**}	50.81±4.61 ^{b**}

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “**” means $p < 0.01$.

Table S21: The mean±SD of serum phosphorus (mg/dL) of various treatment groups at different time intervals.

Group	Day 0	Day 30	Day 60	Day 90
A	4.79±0.36 ^a	5.2±0.08 ^{a*}	5.11±0.14 ^a	4.74±0.16 ^a
B	4.68±0.38 ^a	5.53±0.14 ^{b**}	5.36±0.14 ^{a**}	5.16±0.23 ^b
C	4.56±0.29 ^a	5.36±0.06 ^{a**}	5.42±0.28 ^{a**}	5.2±0.18 ^{b**}
D	4.57±0.37 ^a	5.72±0.09 ^{cd**}	6±0.09 ^{bc**}	5.67±0.14 ^{c**}
E	4.65±0.36 ^a	5.62±0.11 ^{bc**}	5.84±0.15 ^{b**}	5.6±0.18 ^{c**}
F	4.77±0.28 ^a	5.89±0.10 ^{d**}	6.16±0.16 ^{c**}	5.88±0.11 ^{c**}

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “**” means $p < 0.01$.

Table S22: The mean±SD of serum ionized calcium (mg/dL) of various treatment groups at different time intervals.

Group	Day 0	Day 30	Day 60	Day 90
A	7.85±1.07 ^a	6.67±0.75 ^{a*}	5.28±1.1 ^{a**}	4.86±0.75 ^{a**}
B	6.81±1.78 ^a	5.96±0.85 ^{ac}	5.05±0.6 ^{a*}	4.6±0.7 ^{ab**}
C	7.27±1.36 ^a	5.4±1.23 ^{abc**}	5.42±0.66 ^{a**}	4.28±0.58 ^{ab**}
D	7.01±1.16 ^a	4.06±0.71 ^{bc**}	2.75±1.04 ^{b**}	3.39±1.35 ^{bc**}
E	7.53±0.62 ^a	4.82±0.78 ^{c**}	2.78±0.7 ^{b**}	3.18±0.7 ^{bc**}
F	7.13±1.34 ^a	4.03±0.72 ^{c**}	1.7±0.67 ^{b**}	1.96±0.38 ^{c**}

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “**” means $p < 0.01$.

Table S23: The mean±SD of roentgenogram periosteal reaction score of various treatment groups at different time intervals.

Group	Day 0	Day 30	Day 60	Day 90
A	0±0 ^a	0.33±0.52 ^{a*}	0.67±0.52 ^{a*}	0.83±0.41 ^{a*}
B	0±0 ^a	0.67±0.52 ^{ab*}	1.5±0.55 ^{b*}	2±0 ^{b*}
C	0±0 ^a	1±0 ^{b*}	1.83±0.41 ^{b*}	2.83±0.41 ^{c*}
D	0±0 ^a	3±0 ^{ce*}	3.83±0.41 ^{ce*}	4±0 ^{df*}
E	0±0 ^a	3±0 ^{de*}	4±0 ^{de*}	4±0 ^{ef*}
F	0±0 ^a	3±0 ^{e*}	4±0 ^{e*}	4±0 ^{f*}

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S24: The mean±SD of osteotomy line score of various treatment groups at different time intervals.

Group	Day 0	Day 30	Day 60	Day 90
A	0±0 ^a	0.67±0.52 ^{a*}	2±0 ^{a*}	2.83±0.41 ^{a*}
B	0±0 ^a	1±0 ^{a*}	2.67±0.52 ^{b*}	2.83±0.41 ^{a*}
C	0±0 ^a	2.67±0.52 ^{bc*}	4±0 ^{c*}	4±0 ^{b*}
D	0±0 ^a	2.83±0.41 ^{c*}	4±0 ^{c*}	4±0 ^{b*}
E	0±0 ^a	3.5±0.55 ^{d*}	4±0 ^{c*}	4±0 ^{b*}
F	0±0 ^a	3.67±0.52 ^{d*}	4±0 ^{c*}	4±0 ^{b*}

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S25: The mean±SD of critical size defect filling score of various treatment groups at different time intervals.

Group	Day 0	Day 30	Day 60	Day 90
A	0±0 ^a	0±0 ^a	0±0 ^a	0±0 ^a
B	0±0 ^a	1±0 ^{b*}	1±0 ^{b*}	1±0 ^{b*}
C	0±0 ^a	1±0 ^{b*}	1±0 ^{b*}	1.83±0.41 ^{c*}
D	0±0 ^a	1.17±0.41 ^{b*}	3±0 ^{c*}	3±0 ^{d*}
E	0±0 ^a	2±0 ^{c*}	2.83±0.41 ^{c*}	4±0 ^{e*}
F	0±0 ^a	2.33±0.52 ^{c*}	3.83±0.41 ^{d*}	4±0 ^{e*}

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “***” means $p < 0.01$.

Table S26: The mean±SD of microphotometric analysis of 90th day in different treatment groups.

Group	Osteogenesis	Union	Marrow	Cancellous bone	Cortical bone	Total HP score
A	0±0 ^a	0.17±0.41 ^a	0±0 ^a	0±0 ^a	0±0 ^e	0.17±0.41 ^a
B	0.83±0.41 ^b	1±0 ^b	0±0 ^a	0.83±0.41 ^b	0±a ^a	2.67±0.82 ^b
C	1.67±0.52 ^c	1.17±0.41 ^b	0±0 ^a	1.67±0.52 ^c	0.33±0.52 ^{ab}	4.83±0.75 ^c
D	2±0 ^c	2.17±0.41 ^c	0.33±0.52 ^{ab}	2.83±0.41 ^d	0.83±0.41 ^b	8.17±0.75 ^d
E	3.17±0.41 ^d	3.33±0.52 ^d	1.17±0.75 ^b	3.83±0.41 ^e	2.33±0.52 ^c	13.83±1.47 ^e
F	3.33±0.52 ^d	3.5±0.55 ^d	2±0.89 ^b	3.83±0.41 ^e	3.33±0.52 ^d	16±1.1 ^f

The different alphabet and * in superscripts represents significant between groups and within group comparison at different time intervals respectively. Different alphabets means $p < 0.05$, “*” means $p < 0.05$, “**” means $p < 0.01$.