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3 **Figure S1:** Cartoon of mesenchymal stem cell delivery.  
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5 **Figure S2:** Flow diagram outlining the experiments.  
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7 **Figure S3:** Histomorphometric analysis of mesenchymal stem cell transplanted vessels (**M**)  
8 compared to outflow vein vessels removed from animals with AVF only (**C**) at day 7 and 21 after  
9 placement. (**A**) is semiquantitative analysis which shows a significant increase in the average  
10 lumen vessel area of **M** transplanted vessels when compared to control **C** group for day 7  
11 ( $P<0.05$ ) and 21 ( $P<0.05$ ). (**B**) is semiquantitative analysis for the average area of the  
12 neointima/average area of the media/adventitia for both groups at day 7 and 21. By day 21,  
13 there was a significant decrease in the average area of the neointima/average area of the  
14 media/adventitia in the **M** transplanted vessels when compared to the **C** group ( $P<0.05$ ) (**C**) is  
15 semiquantitative analysis for the average cell density in the neointima for both groups at days 7  
16 and 21. By day 7, the average cell density of the neointima in the **M** transplanted vessels was  
17 significantly lower than the **C** group ( $P<0.0001$ ) and remained lower by day 21 ( $P<0.05$ ). Each  
18 bar represents a mean  $\pm$  SEM of 4-6 animals per group. Two-way ANOVA followed by Student  
19  $t$ -test with post hoc Bonferroni's correction was performed. Significant differences among **M**  
20 transplanted and **C** vessels is indicated by \* $P<0.05$  or ## $P<0.0001$ .  
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37 **Figure S4:** Semiquantitative analysis for TUNEL and Ki-67 staining in murine AVF at day 7 and  
38 21 after placement of AVF in outflow vein alone (**C**) and MSC transplanted vessels (**M**). (**A**) is  
39 the semiquantitative analysis for TUNEL staining for **M** transplanted and **C** vessels at days 7  
40 and 21. By day 7, the average density of cells staining positive for TUNEL (brown staining  
41 nuclei) at the outflow vein of **M** transplanted vessels was significantly higher than the **C** group  
42 ( $P<0.0001$ ) and by day 21, it remained significantly increased ( $P<0.05$ ). (**B**) is the  
43 semiquantitative analysis of Ki-67 immunostaining at days 7 and 21. By day 7, there was a  
44 significant reduction in the average Ki-67 index in the **M** transplanted vessels when compared to  
45 **C** vessels ( $P<0.0001$ ) and remained significantly lower by day 21 ( $P<0.05$ ). Each bar represents  
46 a mean  $\pm$  SEM of 4-6 animals. Two-way ANOVA followed by Student  $t$ -test with post hoc  
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3 Bonferroni's correction was performed. Significant differences among **M** transplanted and **C**  
4 vessels is indicated by \* $P < 0.05$ , \*\* $P < 0.001$ , or ### $P < 0.0001$ .  
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7 **Figure S5:** Semiquantitative analysis for FSP-1 and  $\alpha$ -SMA staining in murine AVF at day 7 and  
8 21 after placement of AVF in outflow vein alone (**C**) and MSC transplanted vessels (**M**). (**A**) is  
9 the semiquantitative analysis of FSP-1 staining for **M** transplanted and **C** vessels at days 7 and  
10 21. By day 7, the average density of cells staining positive for FSP-1 at the outflow vein of **M**  
11 transplanted vessels was significantly lower than the **C** group ( $P < 0.001$ ) and by day 21, it  
12 remained significantly increased ( $P < 0.01$ ). (**B**) is the semiquantitative analysis of  $\alpha$ -SMA  
13 staining for **M** transplanted and **C** vessels at days 7 and 21. By day 21, the average density of  
14 cells staining positive for  $\alpha$ -SMA at the outflow vein of **M** transplanted vessels was significantly  
15 lower than the **C** group ( $P < 0.05$ ). Each bar represents a mean  $\pm$  SEM of 4-6 animals per group.  
16 Two-way ANOVA followed by Student *t*-test with post hoc Bonferroni's correction was  
17 performed. Significant differences among **M** transplanted and **C** vessels is indicated by \* $P < 0.05$ ,  
18 # $P < 0.01$ , or ### $P < 0.0001$ .  
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33 **Figure S6:** Semiquantitative analysis for HIF-1 $\alpha$  and CD68 staining in murine AVF at day 7 and  
34 21 after placement in outflow vein alone (**C**) and MSC transplanted vessels (**M**). (**A**) is the  
35 semiquantitative analysis of HIF-1 $\alpha$  staining for **M** transplanted and **C** vessels at days 7 and 21.  
36 By day 7, the average density of cells staining positive for HIF-1 $\alpha$  at the outflow vein of **M**  
37 transplanted vessels was significantly lower than the **C** group ( $P < 0.0001$ ) and by day 21, it  
38 remained significantly increased ( $P < 0.0001$ ). (**B**) is the semiquantitative analysis of CD68  
39 staining for **M** transplanted and **C** vessels at days 7 and 21. By day 7, the average density of  
40 cells staining positive for CD68 at the outflow vein of **M** transplanted vessels was significantly  
41 lower than the **C** group ( $P < 0.05$ ). Each bar represents a mean  $\pm$  SEM of 4-6 animals per group.  
42 Two-way ANOVA followed by Student *t*-test with post hoc Bonferroni's correction was  
43 performed. Significant differences among **M** transplanted and **C** vessels is indicated by \* $P < 0.05$   
44 or ### $P < 0.0001$ .  
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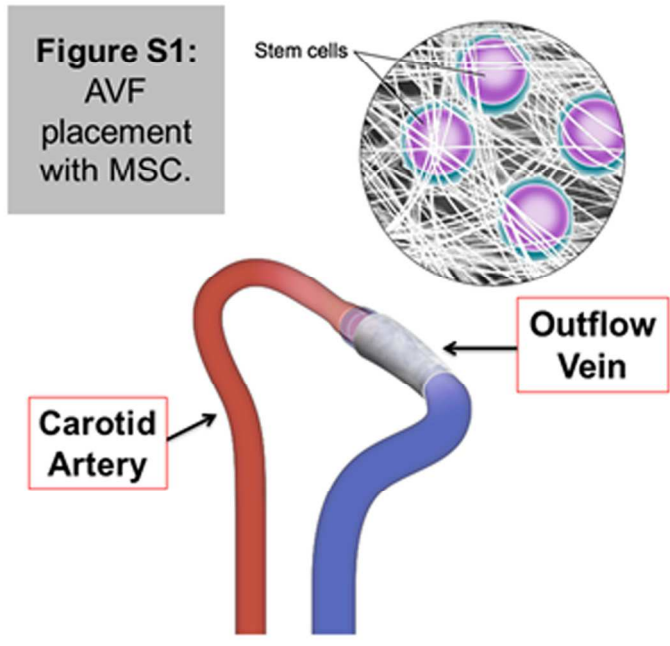


Figure s1  
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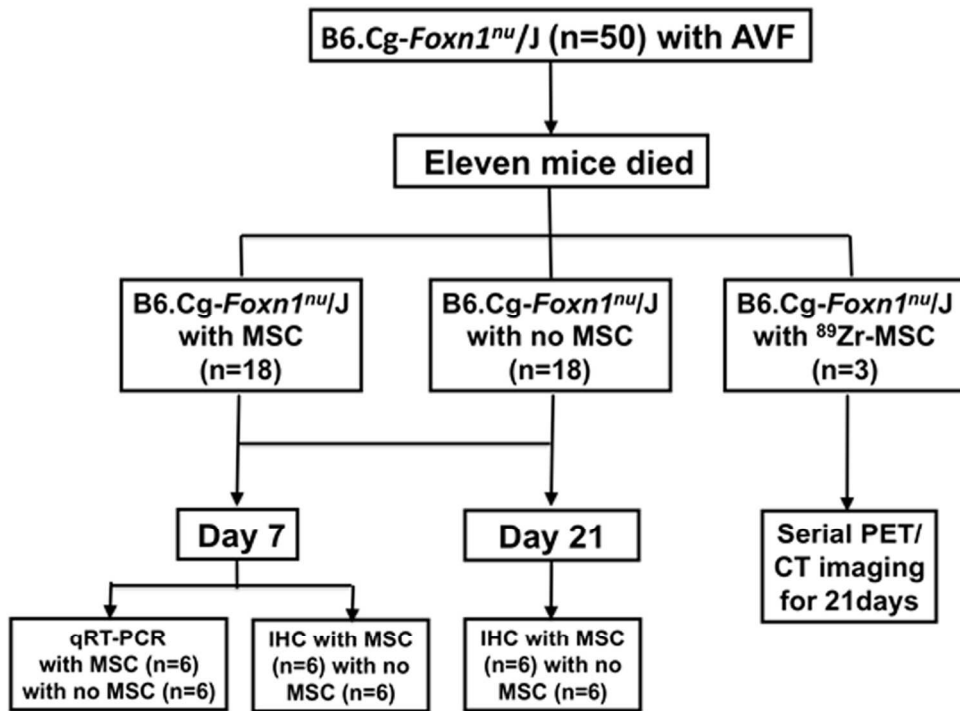


Figure s2  
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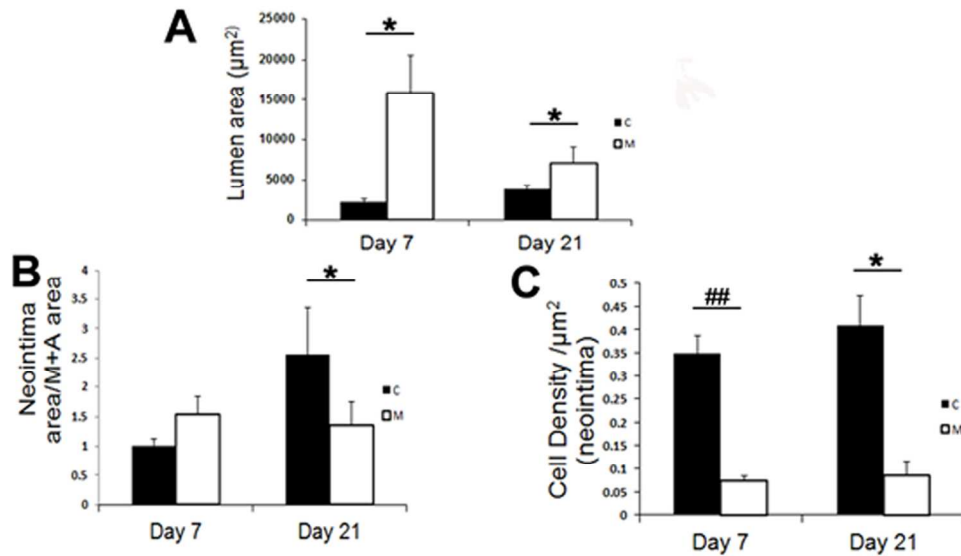


Figure s3  
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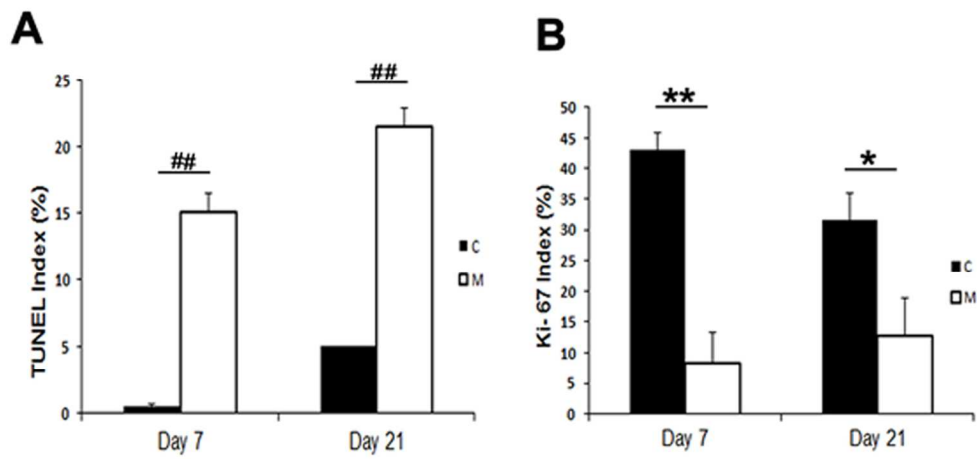


Figure s4  
98x47mm (300 x 300 DPI)

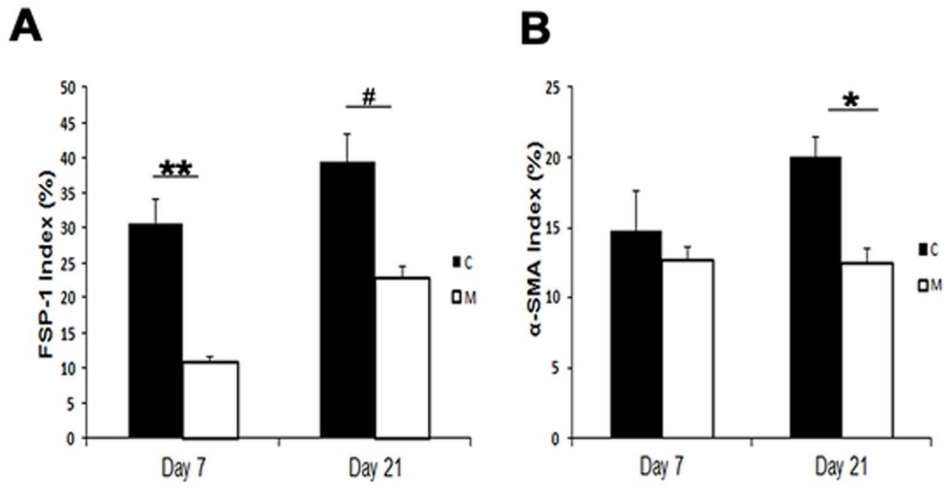


Figure s5  
105x54mm (300 x 300 DPI)

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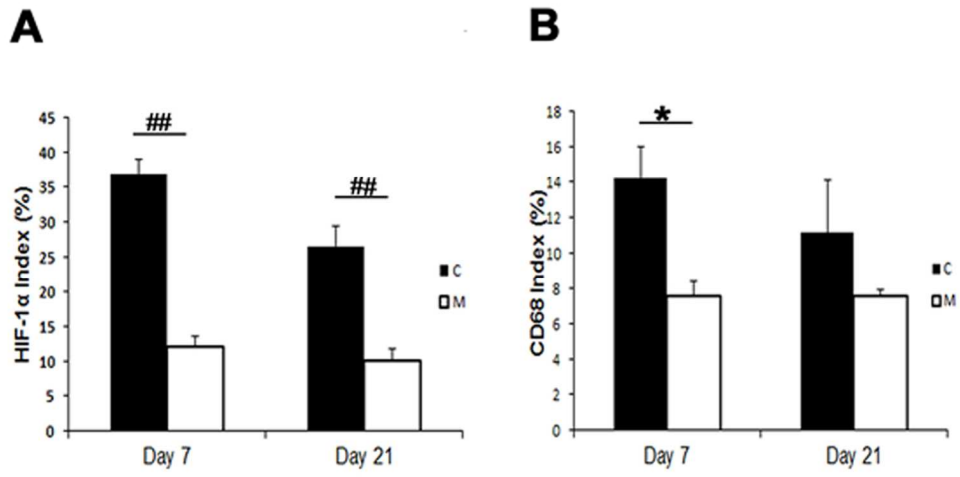


Figure s6  
102x51mm (300 x 300 DPI)